HEALTHY FOOD FOR HEALTHY LIFE APPLICATION

By

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Dissertation submitted in partial fulfillment of
the requirements for the
Bachelor of Technology (Hons)
Information Communication Technology

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CERTIFICATION OF APPROVAL

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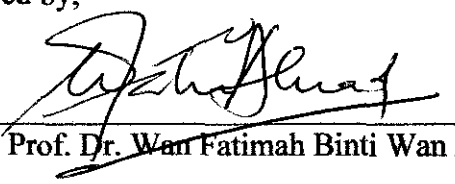
Approved by,



(Assoc. Prof. Dr. Wan Fatimah Binti Wan Ahmad)

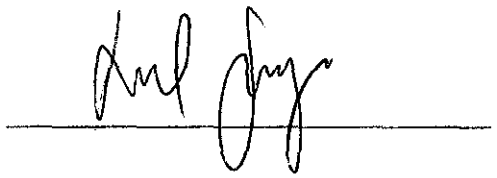
Universiti Teknologi PETRONAS

TRONOH, PERAK

September 2011

CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.



NURUL FARSYA BTE RAMLI

ACKNOWLEDGEMENT

In the name of Allah, the Most Gracious, the Most Merciful. Praise to Him the Almighty that in his will and given strength, had I managed to complete this Preliminary report in time.

Throughout the given period, numbers of people have contributed in achieving the objectives to prepare me with competence knowledge and useful experience in developing and completing my Final Year Project, Preliminary report.

My deepest gratitude full appreciation goes to Dr Wan Fatimah, Supervisor for my Final Year Project (FYP) in which giving this valuable chance for me to get assisted with her for the whole period in doing this FYP.

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ABSTRACT

This study examines on developing an application to reduce the number of overweight people worldwide. This application will be using Facebook as a platform. Since Facebook is now at the first ranking of Social networking, hence, developer believed this application will be useful and helpful to all users especially who are affected with this illness. By examining the previous studies, reports and journals on the disease, Author clarifies the process by providing few suggestions on healthy meals to users who use this application based on the calculated Body Mass Index (BMI).

The time period studied in this dissertation includes the researches on journals, studies from previous research papers, statistics on the disease by World Health Organization (WHO), and the rise and fall of National Health and Nutrition Examination Survey (NHANES) programs. I use two major research strategies: (1) few case studies and (2) a quantitative analysis of survey data.

Data have been collected from archives journals, newspapers, statistics, survey and published reports.

In conclusion, there are relevancies in doing Healthy Food for Healthy Life Facebook application. This is due to the results from the survey that had been done. In future, development of product will be started and the final objective which is Usability test will be conducted at the middle stage of development and final stages of development to ensure users satisfies and meet the Human Computer Interaction requirement i.e. Consistency, Easy to learn and remember etc.

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

On today generation, the Internet has become a part of everyone's' daily life and work. The Internet carries a huge range of information resources, services, entertainment and many more. Because of the dependency to Internet, this may be one of the reasons why people are doing less physical activities. Based on survey done by National Health and Nutrition Examination Survey (NHANES), they found that inner-city residents are more overweight, less physically active, and less healthy overall than the general population. (Keberhadt,M. & Pamuk,E. (2004)) Besides that, based on survey conducted by National Health Interview Survey (1997–1998), they found out that men living in center cities were more likely to be obese (39.4%) than men living in rural areas (35.5%). (Schoenborn, C. et al. (2002))

One of the services provided by Internet is Social Network Service. A social network service is an online service, platform, or site that focuses on building and reflecting of social network or social relations among people, e.g., who share interests and/or activities According to Lashinsky, A. (2005), Social networking such as Facebook has become a ubiquitous feature of online life and largest social networking site in the world. Besides that, an active Facebook user are over 500 million people worldwide and is now used by 1 in every 13 people on earth, with over 250 million of them (over 50%) who log in every day. (Facebook.com). As all the information can be spread easily, this is why the Author decided to develop a Healthy Food for Healthy Life application as one of the application for Facebook.

information can be spread easily, this is why the Author decided to develop a Healthy Food for Healthy Life application as one of the application for Facebook.

What is healthy food for healthy life is all about? Basically, this application will provides information on Minerals, Proteins, Carbohydrate and etc that contains in food. Next, user will need to input their weight in Kilogram (Kg) and height in Meter (m). From the calculated BMI, user will know whether he/she is underweight, normal or overweight. Last but not least, user will be provided with few suggestion foods daily (Breakfast, Lunch and Dinner) that they should take based on the calculated BMI. From this application, the Author hopes that number of overweight people worldwide, especially in Malaysia will reduce. Researches, doctors, government throughout the World has together put an effort to reduce the number of people affected with this disease, unfortunately the affected people still at the high rate. With this application, hopefully people will aware and together reduce the disease among them.

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1.2 PROBLEM STATEMENT

1) People today are too dependent on internet for services, social networking, sharing resources and etc. Hence, people are less doing physical activities. According to the survey done by NHANES, most of the residents who lived in inner-city are more overweight, less physically active, and less healthy overall than the general population (Keberhadt,M. & Pamuk,E. (94(10)) (2004). Besides that, based on survey conducted by National Health Interview Survey (1997–1998), they found out that 39.4% of men living in center cities were more likely to be affected with obese than men living in rural areas which is only 35.5%. (Schoenborn, C. et al. (2002) in In Advance Data. Hyattsville MD, National Center for Health Statistics)

2) No of obesity disease increasing worldwide, especially in Malaysia. According to the Dewan Rakyat, Deputy of Health Minister Datuk Rosnah Abdul Rashid Shirlin said that Malaysia has the highest obesity rate among Southeast Asian countries and ranked sixth in Asia-Pacific region. (News Straits Times(2011,14 November))

3) Most of Facebook applications are on games and less informative applications, such as information regarding on Health. From the source on Facebook Statistics (2010), 53% of Facebook users are using games application and currently, Facebook has more than 500 million total users. The average times spent by them per month are 421 minutes and 50% of the Facebook users log-in to play games compared to do other activities such as using an informative applications.

4) Many websites that have been developed did not meet the HCI requirement in Interface design. For example no consistency, too colorful websites, users have difficulties to understand the instructions, users need to log-in in order to get the information and many more.

1.3 OBJECTIVES

1) Research on suitable Principle that can apply in designing suitable interface.

2) Develop an application that provides healthy food.

3) Conduct Usability test for Healthy Life application.

The first objective is to have researches on suitable Principle that can apply in designing suitable interface. The fundamental designs principles are to know the user, make functions, objects and information are visible (reduce cognitive load), provide good error message, and maintain consistency and clarity. In addition, there are also rules in Human Computer Interaction that is known as Schneiderman's 8 Golden Rules and Norman's 7 Principles. By applying these rules and principles, this application is meeting the requirement in interface design.

Second objective is to develop an informative application on healthy food conscious based on calculated Body Mass Index (BMI) and embed it into Facebook social network. Facebook currently is the most popular Social Network and the number of users is about five hundred million over the world. Since Facebook is known

worldwide, this is the best opportunity to embed an informative application into it to encourage people together reduce the number of obesity disease.

Finally, at the end of the day, there will be a usability test conducted on few students to ensure this Healthy Food for Healthy Life application meet all the requirements in Human Computer Interaction design in all aspects such as easy to use application, less cognitive load, easy to remember instructions, consistency and etc. The User Acceptance Test (UAT) will be tested under three categories which are consistency, learnability and also satisfaction.

1.4 BENEFITS

1) The benefits of this application are, it will help to increase awareness on people regarding healthy food based on the information given.
2) This system also may help to reduce the number of obesity by providing few suggestion meals for Malaysian people.
3) It also can increase efficiency and effectiveness Facebook users by having faster access to the information.

1.5 SCOPE OF STUDIES

The scope of this application is for Facebook users especially in Malaysia. The users for this application are people who are concern in taking healthy food every day and people that are affected with obesity disease. Other than that, users that are also care on taking balance food everyday can also use this application as a guide in taking healthy food daily.

CHAPTER2

LITERATURE REVIEW

2.1 BACKGROUND STUDIES

Figure 2.1 shows a healthy food pyramid. From the bottom, which is the lowest part is Carbohydrates. It consists of whole grin such as rice, wheat, corn, etc. Carbohydrates will help in providing most energy for our body. The higher-up level is Fruits and Vegetables. For this type of food, it contributes the most vitamin intake for our body, especially dark green leafy vegetables, orange/red vegetables. A dark green vegetable contains the most nutrients for the body and orange/red contains beta carotene that is required for making vitamin A. In addition, vegetables also helps and good for digestion. Food such as Meat, Poultry, Fish, beans, nuts, milks, cheese, yogurt, dairy products should be consumed in moderation. Meat, Poultry are a good source of protein but as the saying goes too much of something is bad enough. Instead of taking Meat, Fish has more proteins and healthier to eat. The least food that should be taken in healthy life is fats, oils and sweets. Fats and oils contain a lot of lipid substances that is easily deposited in skin, buttocks, belly, neck, blood vessel and the outer layer of heart.

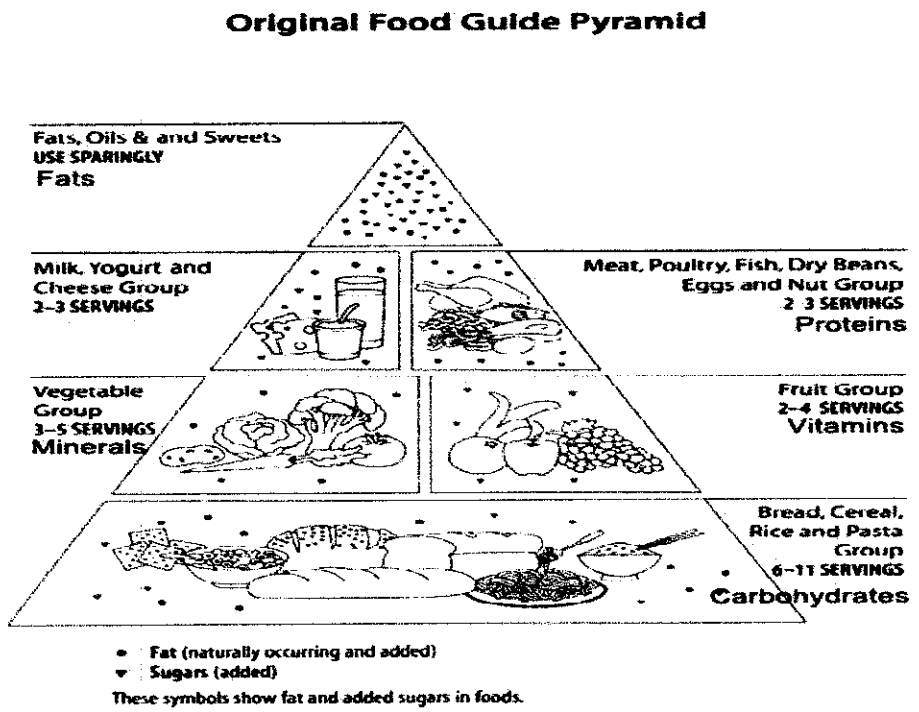


Figure 2.1: Food Pyramid (J. Nutr. March 1, 1999)

In order to achieve a Healthy Life, eating a balance food is important because no single food contains the whole nutrients, required for good health. Human being needs the energy to live, therefore, it is important to maintain the balance between carbohydrates, protein and fat, which helps everyone to keep healthy and fit.

As the technology becoming more powerful and people can easily access to Internet to get information, daily world news, entertainment such as online games, online movies and etc, people today are getting poor physical activity hence becoming lazier and consume less on healthy food for health.

From the latest news reported by News Straits Times newspaper, on November 14 and 15 2011, Malaysia has highest obesity rate in Southeast Asian countries and ranked sixth in Asia-Pacific region. Besides that, the number of Malaysian affected with diabetes disease has become doubled from 1.5 million sufferers in 2006 to 3million sufferers in 2011. This was reported by Deputy Health Minister Datuk Rosnah Abdul Rashid Shirlin.

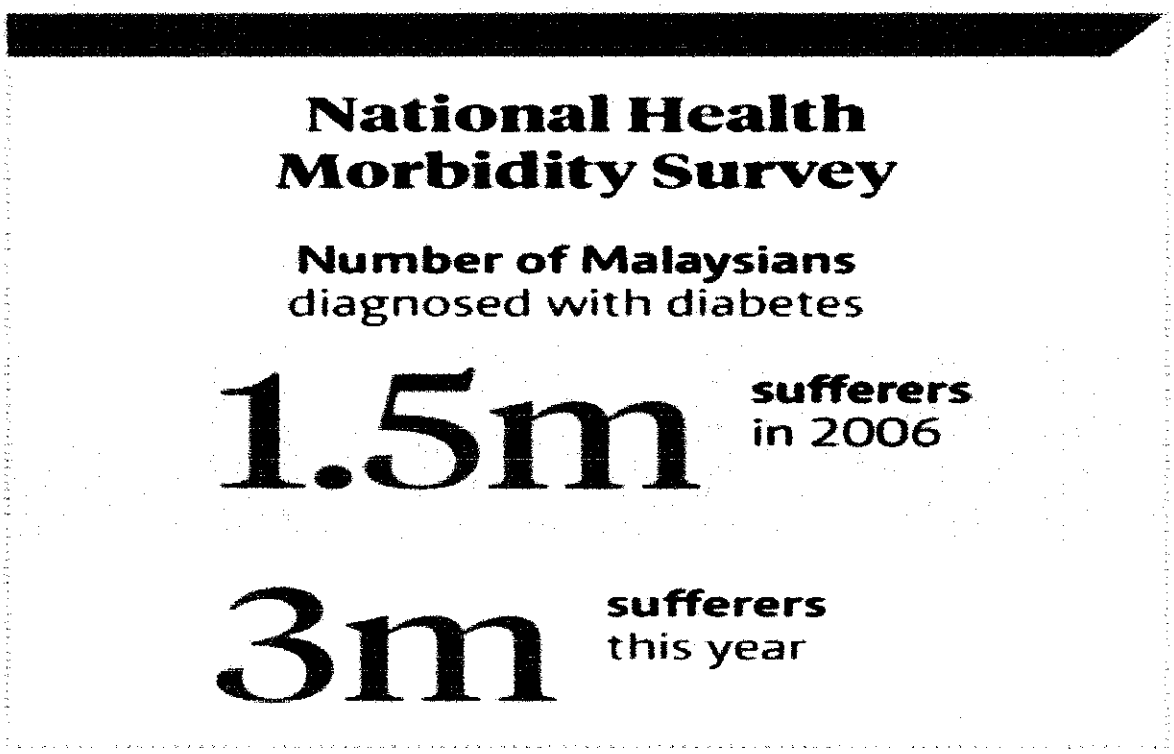


Figure 2.2: Number of Malaysians diagnosed with diabetes
(New Straits Times, November 14 (2011))

According to James, (2003) Obesity is not a new disease introduced to the world. Today, it is increasingly prevalent public health problem. The collaboration program of World Health Organization (WHO) and International Association for the Study of Obesity (IASO), shows approximately 1.7 billion of people are affected to overweight/obesity. In previous study, there were about 1.1 billion were affected to this disease globally. Figure 2.2 shows the statistics people with overweight according to group of ages.

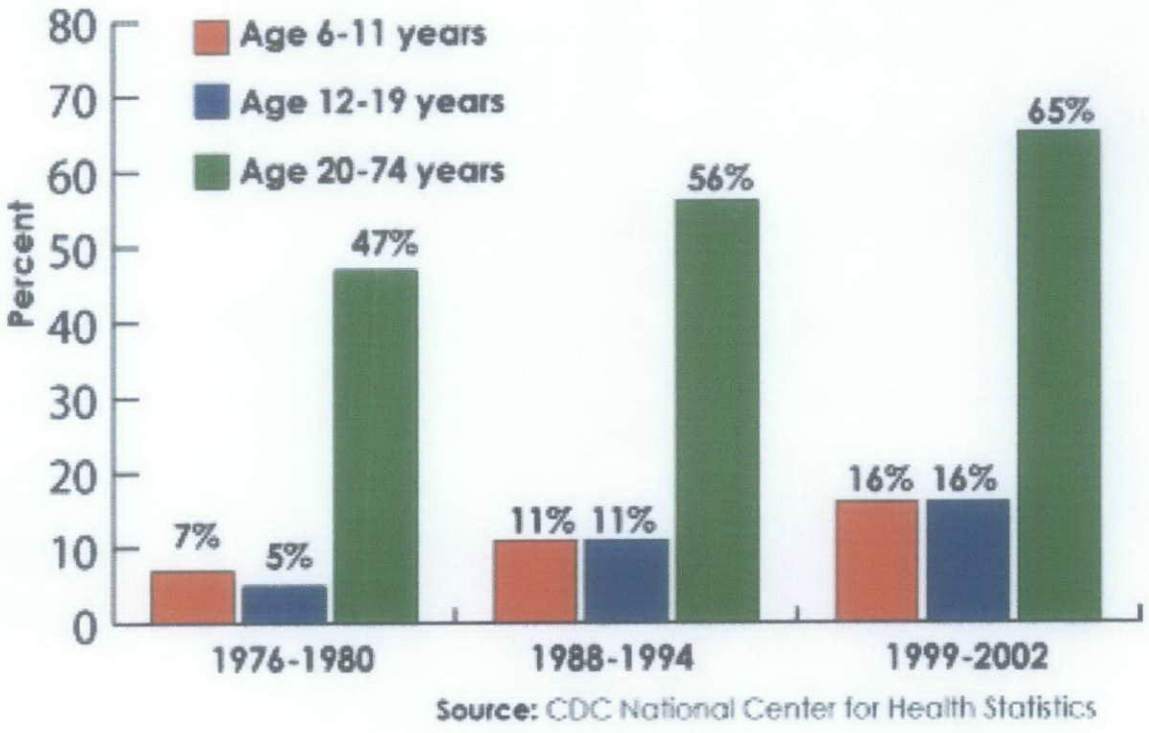


Figure 2.3 Percentage of overweight people 2002
(http://www.obesityinamerica.org/statistics/index.cfm)

In 2007-2008, the age-adjusted prevalence of obesity was 32.2% among men and 35.5% among women. The corresponding prevalence estimates for overweight and obesity combined which have BMI greater or equal than 25 (BMI $\geq$25) were 68.0%, 72.3%, and 64.1%. Obesity occurrence varied by age group and by racial and ethnic group for both men and women. (Katherine M. F. et.al. JAMA (2010)).

Overweight can be calculated by using Body Mass Index (BMI). BMI is a standardize techniques and equipment using by National Heart, Lung, and Blood Institute and the World Health Organization (WHO) in calculating overweight, underweight or obesity. BMI is calculated as weight in kilograms divided by the square of height in meters. For BMI value of 25.0 or higher, it is defined as overweight. Underweight results in BMI of lesser than 25.0 while obesity is 30.0 or higher, and extreme obesity as a BMI of 40 or higher. (World Health Organization [WHO], 2008)

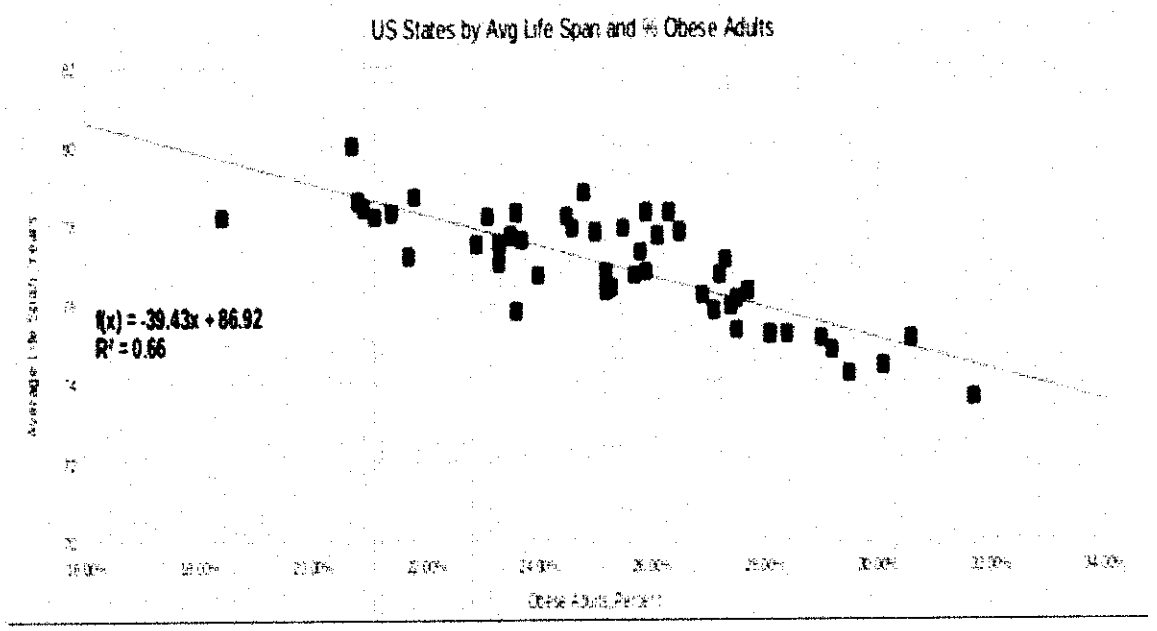
According to socioeconomic status (SES), one of the main factors of obesity was concluded that there are strong positive relationship among men, women and children with obesity in developing countries. Practically 90% of the studies conducted in developing societies, and all these studies showed almost the same result. Obesity has become a very serious health economic issue. Further, obesity is a substantial risk factor for most of serious diseases including heart disease, cancer, diabetes and many more. (Monteiro, C.A et.al. 2003)

Similarity was also found by the Second National Health and Morbidity Survey of Malaysia. A survey was conducted between 1994 and 1996 involving more than 30 000 subjects aged 18 years and older. They have reported that the number of overweight and obesity were also increasing as 4.4% and 16.6%. This disease was affecting the adults and children especially from the developing countries, urban population (17.4%) while rural populations (15.5%). Therefore, a national strategy needs to be developed to tackle both dietary and activity contributors to the excess weight gain of the World's population. (Khor.G.L et al. (1998) Prevalence of overweight among Malaysian adults from rural communities)

In Journal of Public Health Policy, volume 25, Hayne et al. (2004) cited in the United States food environment, the number of people affected by this disease is increasing because of discourage physical activity while encouraging the consumption of greater quantities low-nutrient foods. There are many advertising on unhealthy food, and receive insufficient dietary information, especially at restaurants. While in the US

school environment children have access to sugary sodas and unhealthy á la carte foods in their cafeterias, at the same time getting poor physical activity and nutrition education. In the built environment, it has reduced active living.

Figure 2.3 below shows the Graf of lifespan of people with overweight. According to Thomas,T.S & Harold, E. (1999), researchers have also found that as the numbers of people overweight are increasing, their lifespan are decreasing. This means people with overweight have shorter lifespan (Die earlier).



Source: CDC National Center for Health Statistics

Figure 2.4: Average obesity lifespan in US state
(Acts Med Okayama 1999;53 (4):149-169)

2.2 MAIN ISSUES

Although the number of people affected by overweight and obesity are increasing around the whole country in the world, the number of obese people is still at the high rate of highly prevalent serious disease. Why do this happen?

In a National study on the prevalence of obesity among 16,127 Malaysians article, Rampal, L. et al. (2007) revealed there are few weaknesses founded in solving obesity issues. Firstly, have difficulties in understanding of energy balance in populations. Secondly is a shortage of up to date evidence about the emergence of obesity-related diseases. Last weakness is the lack of studies on public health involvement to control energy balance. These are areas of significant weakness which have been identified.

According to Melin, I, et al. (2005) there were also other actions taken by the professionals in order to reduce the number of obesity among societies. Actions that have been conducted were on Education, working organization, a structural behavior treatment program, guidance and supervision of the health care professional. They were factors significant in creating and for the start of an obesity treatment program. These observations facilitated the implementation of obesity treatment in large scale in the primary health care and increase the possibility for success supposedly. As the same result was received, there was still high number of obese people in many countries.

Thomas, H (2006) has reported that among adults, there was modest increase in physical activity prevented weight gain over a 4-year period. Several studies have demonstrated that although dietary restrictions have the largest impact on weight gain, physical activity combined with dietary restrictions has a larger impact than either alone. Unfortunately, the governments, doctors, and expertise have tried to encourage people to take in a balanced diet on daily meals and have physical activities 90 minutes of exercise per week, but not many of people are obey to them nor have a practice on it.

2.3 RESOLVING ISSUES

Awareness stands by its own will not help people to realize on the bad effects of obesity. Therefore, this Final Year Project is working on resolving this issue. To overcome this situation and ensure that information on health and healthy diet is

delivered effectively to users, one of the possibilities that have been recognize is by using Social Network such as Facebook.

There are many websites providing information that are focusing on health, healthy diet, prevent overweight as well as preventing obesity such as http://www.diet.com/, http://www.health.com/health and many more. However, people have less interest on reading them. For example, Figure 2.4 is a health website that needs user to sign up before entering and be able to read the whole article. Log in to a website is a troublesome to users. That is one of the reasons why do people have less interest on reading them. Besides that, other common reason is because of uninteresting design interface and article. The article may be too wordy and hence makes the user feel bored and have no interest, hence, information is not sending out to user successfully. Figure 2.5 and Figure 2.6

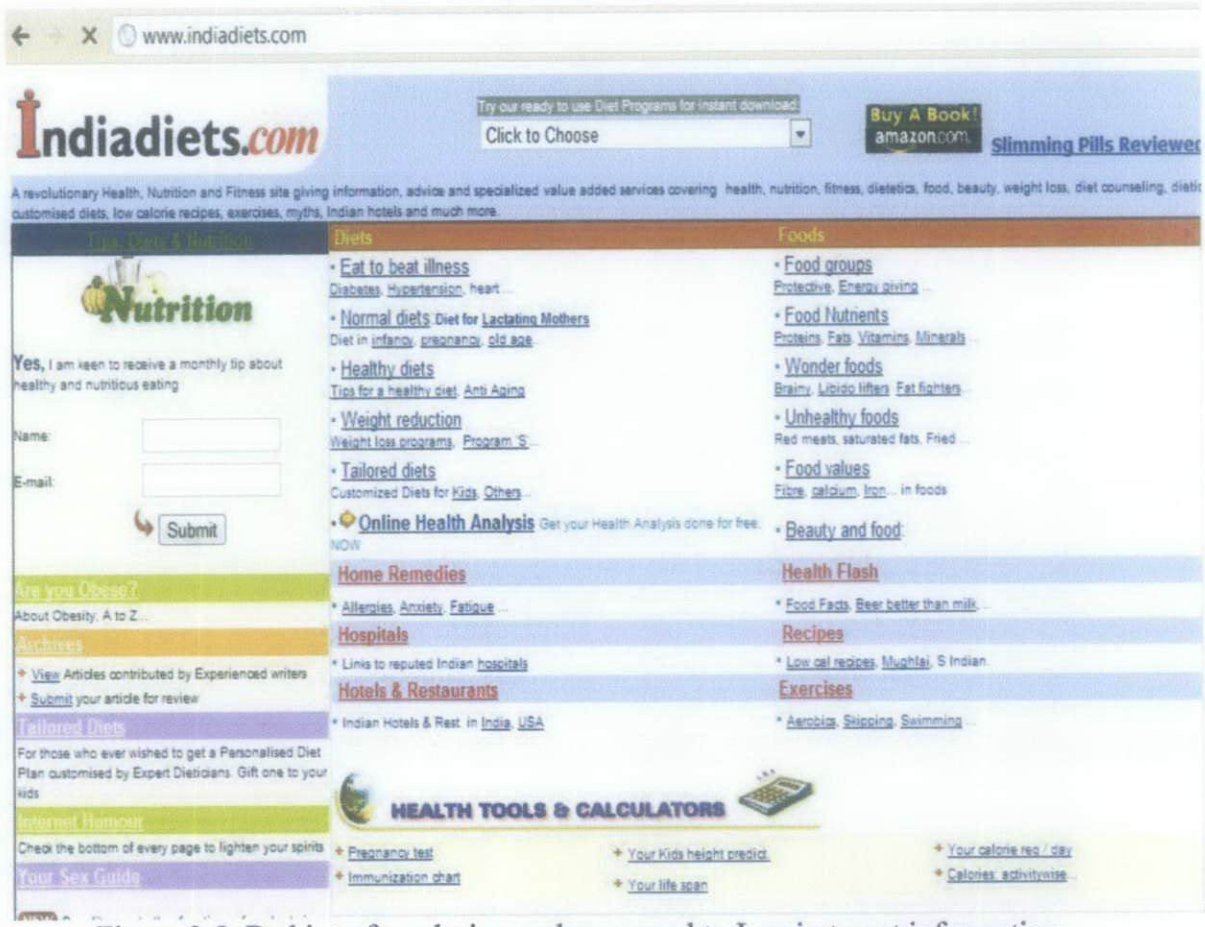


Figure 2.5: Bad interface design and user need to Log in to get information (www.indiadiets.com)

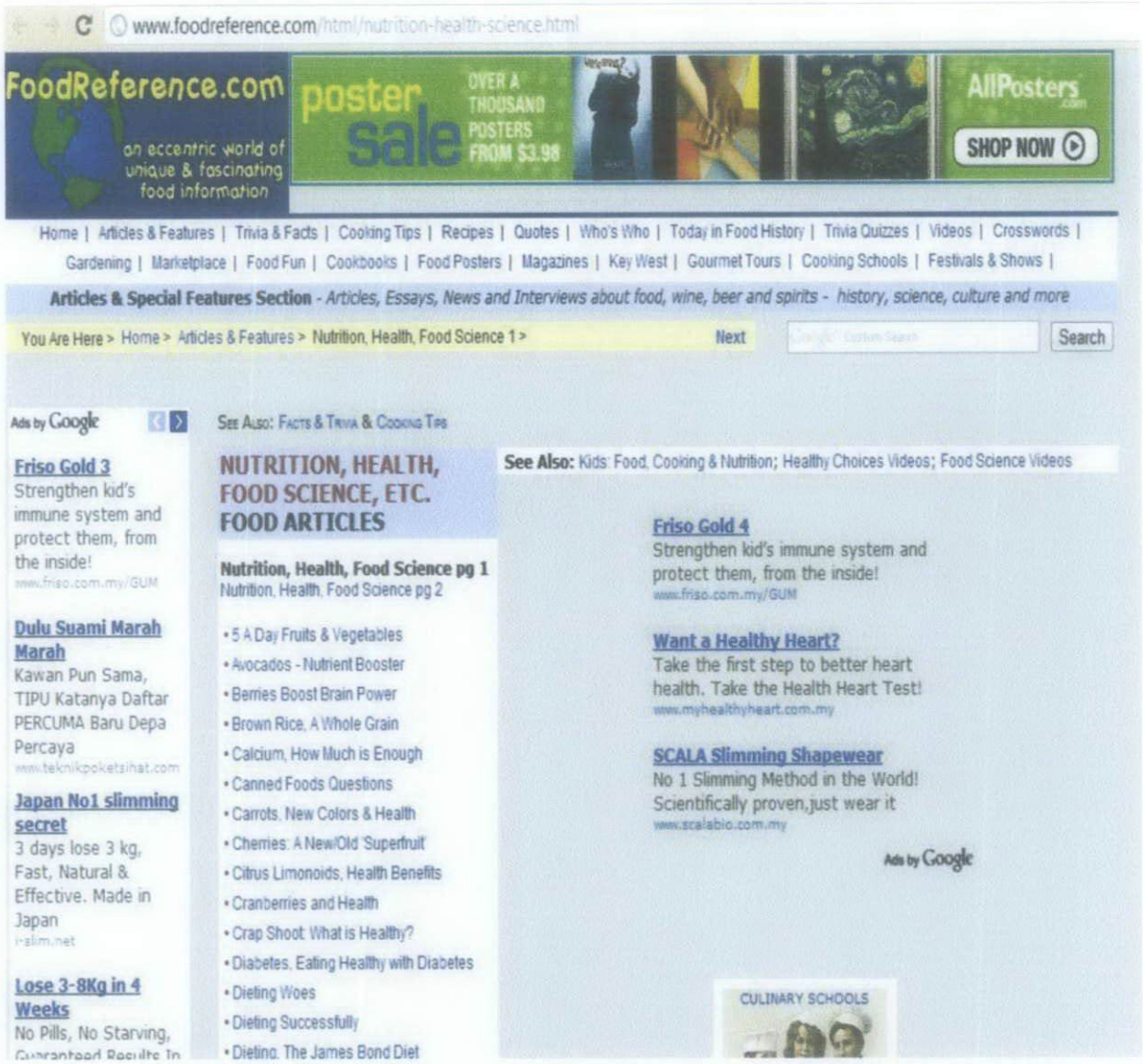


Figure 2.6: Not interesting website

(http://www.foodreference.com/html/nutrition-health-science.html)

Figure 2.7: Information is too long

(http://eatless.com/store/facts/nutriens)

Figure 2.7 and Figure 2.8 show that current BMI website only focusing on how to calculate BMI and display them to the users without taking into considerations whether or not the user is overweight/underweight or normal. Figure 2.9 shows a new and more advance BMI calculator. However the drawback is, it takes longer time for loading especially in low connection area such as in Universiti Teknologi PETRONAS (UTP). For the first time visiting this website, Author has to wait for about 20 minutes for loading and before the calculator can be used.

Hence, in this project, user will be able to calculate their BMI and from the calculated BMI, there will be lists of food that a user should take in daily in order to keep healthy and thus reduce the number of overweight disease especially for Malaysian people.

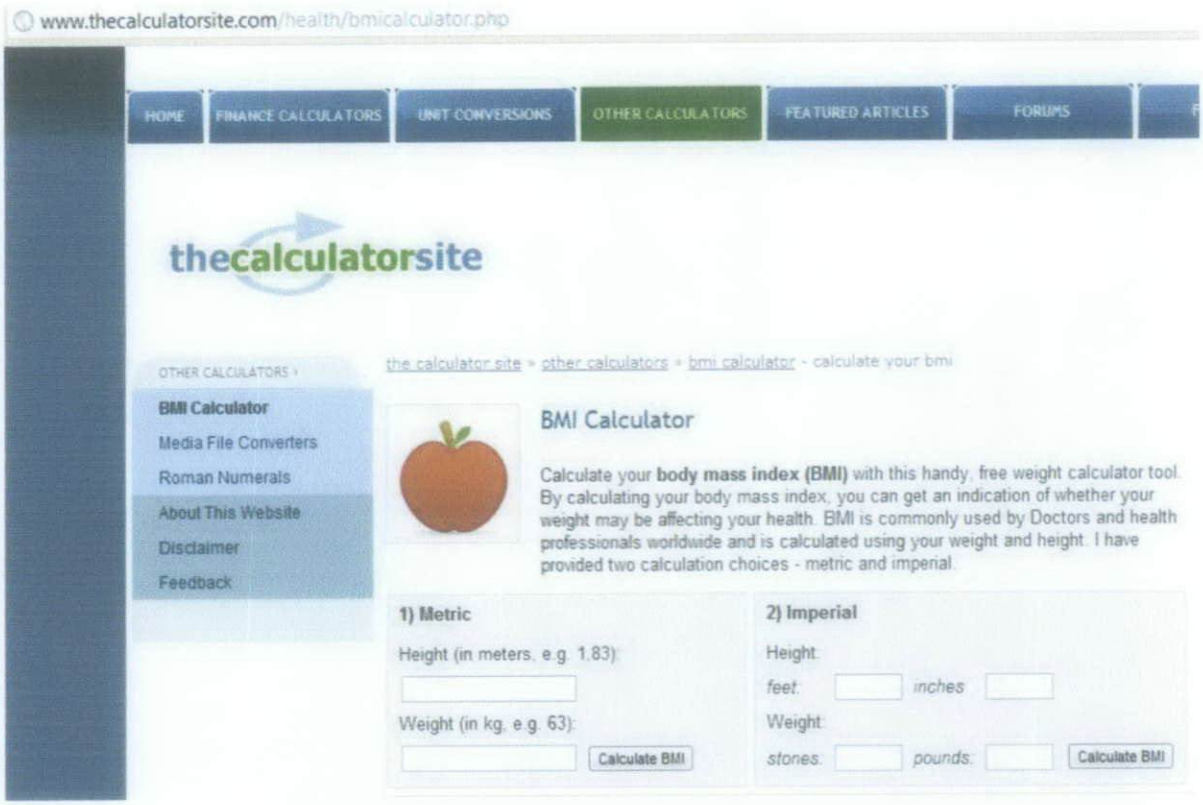


Figure 2.8 Only BMI calculators with no suggestions meal.

(http://www.thecalculatorsite.com/health/bmicalculator.php)

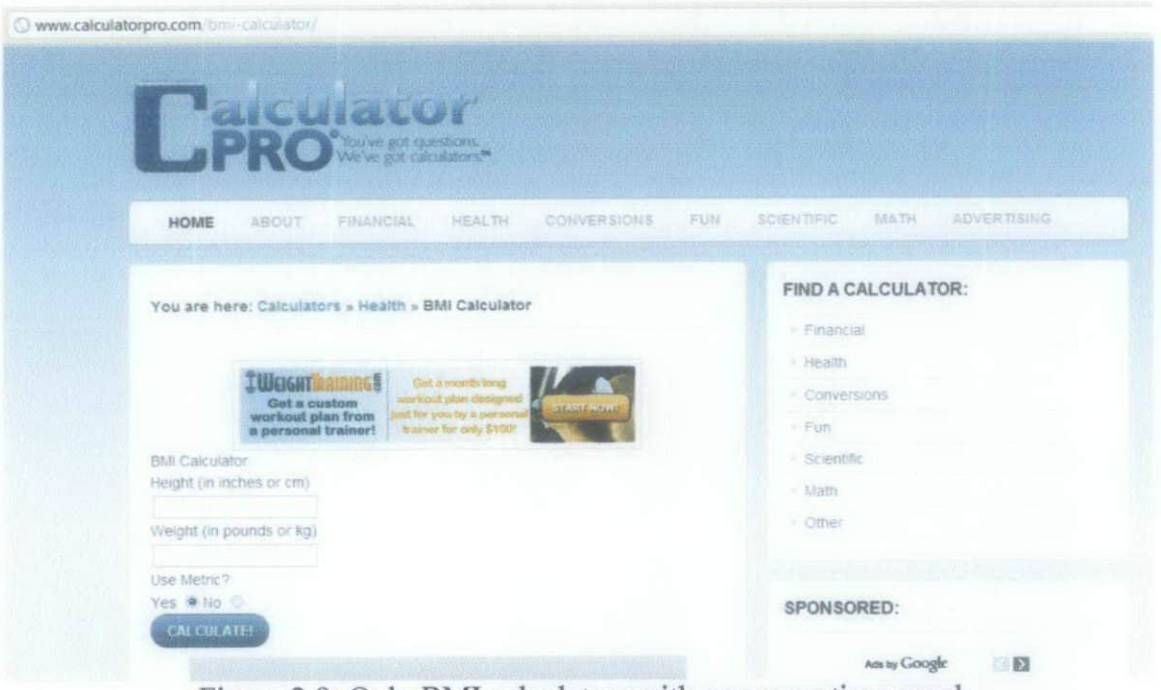


Figure 2.9: Only BMI calculators with no suggestions meal.

(http://www.calculatorpro.com/bmi-calculator/)

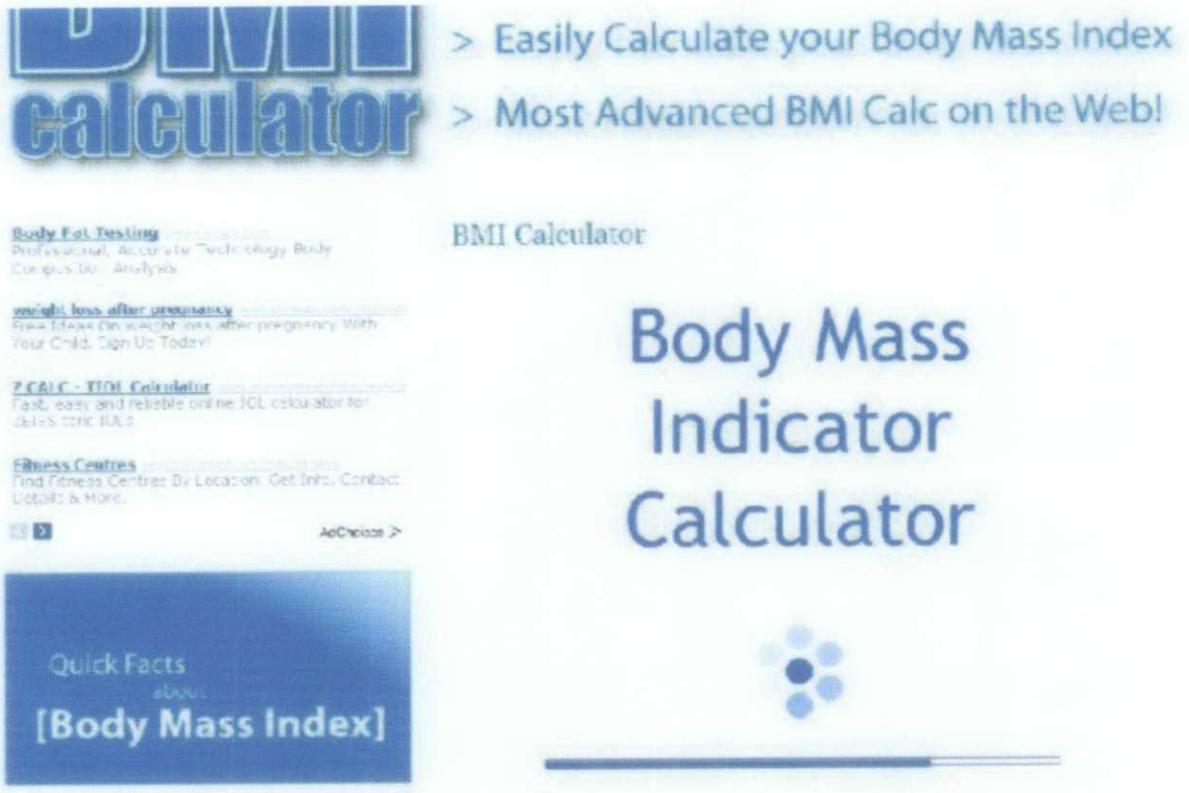


Figure 2.10 Needs longer time to load the page.
(http://calculate-bmi.com/bmi-calculator.html)

In this research, it will focuses on how to develop a Facebook application that will successfully educate people on the importance of eating healthy food in daily life. Besides that, while designing the interface of the application, it has to meet the requirement of Human Computer Interaction (HCI) such as consistency, easy reversal, reduce memory load and etc.

Today, we are living in Technologies and Internet Era. Globally, people who have online access have digital sources as their number one media channel. 61% of online users use the internet daily against 54% for TV, 36% for Radio and 32% for Newspapers.

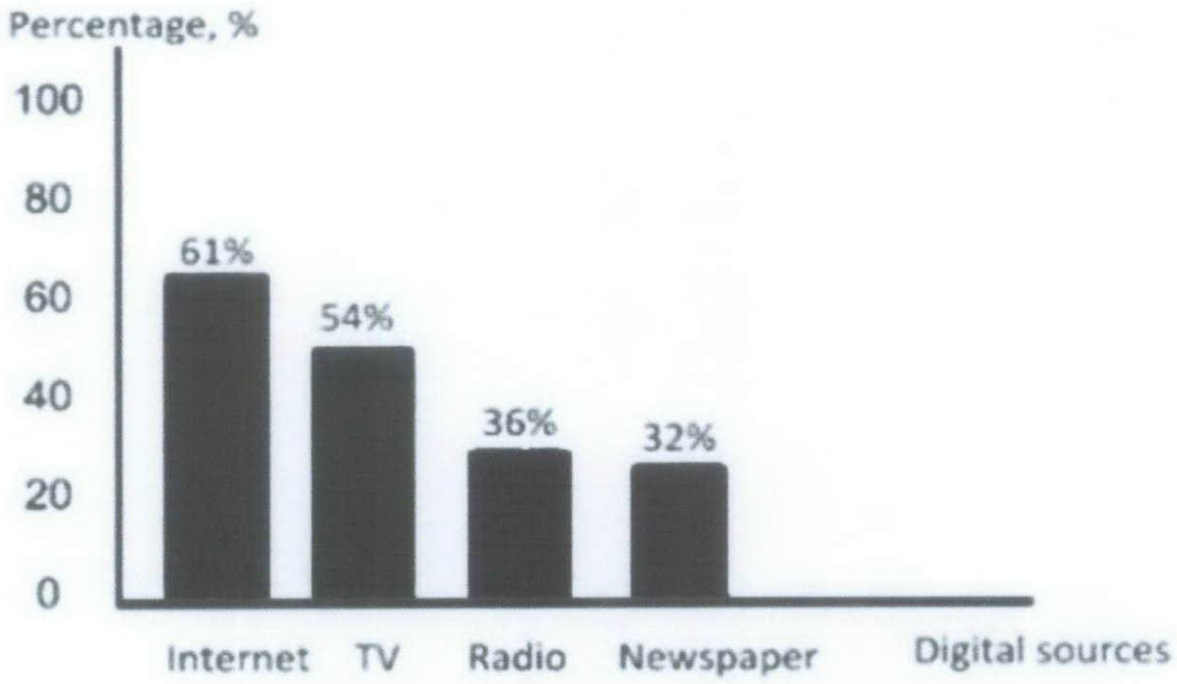


Figure 2.11: Most preferred Digital sources
(www.discoverdigitallife.com(2010))

Since Internet has become the most powerful medium today, people are more interested and prefer to spend the whole day in front of computer and browse through Internet to gain information, resources and even for social networking. In latest social networking review in 2011, Facebook is at number one ranking. My space has drop from first rank to second and followed by Bebo, Friendster, hi-5 and Orkut. Number of users that are using Facebook currently is about five hundred million users and 50% of the active users log on to Facebook in any given day. In additional, people spend over 700 billion minutes per month connecting to this social network. Figure 2.9 is displaying the total active users on Facebook.

Total active users[N 1] (in millions)

Date	Users	Days later	Monthly growth[N 2]
August 26, 2008	100[27]	1,665	178.38%
April 8, 2009	200[28]	225	13.33%
September 15, 2009	300[29]	150	10%
February 5, 2010	400[30]	143	6.99%
July 21, 2010	500[31]	166	4.52%
January 5, 2011	600[32][N 3]	168	3.57%
—	700	56 (ongoing)	—

Figure 2.12 Total active users on Facebook (Facebook.com (2011))

According to Facebook Applications statistics (2009) below, Figure 2.10 has revealed that most of the Facebook applications are Just for Fun. Most of them are under Games categories, with little or less informative application to educate users, but a lot of animations, gaming activities, or streaming media (videos).According to Facebook Analytics and Developer Services, number of applications that currently in Facebook is about 57,514. Zynga Company is at rank number one of developing Games applications on Facebook and the daily active users is about 4,675,441 users.

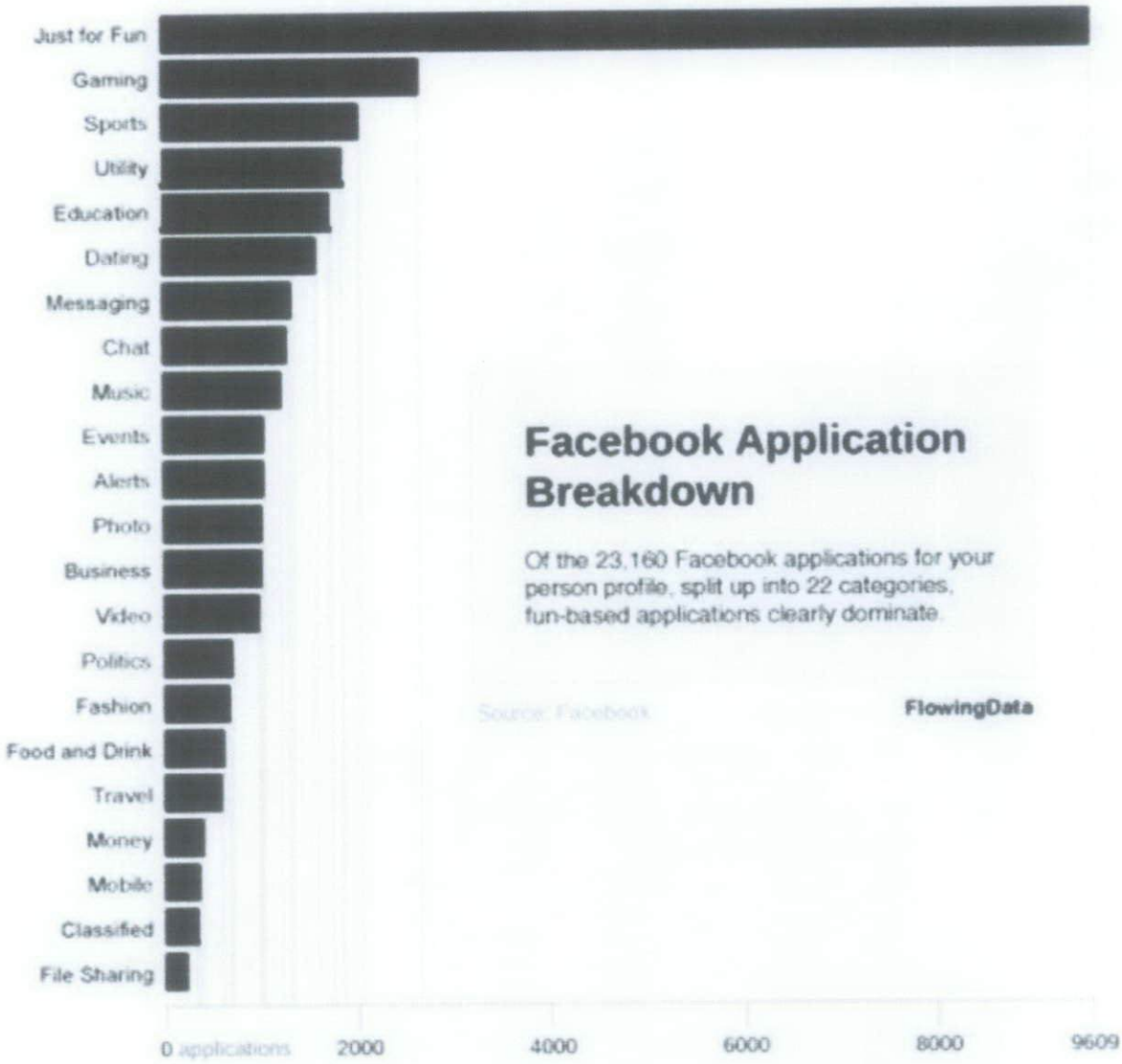


Figure 2.13: Facebook breakdown structure (Facebook.com)

Since there are too many unbeneficial and non-informative applications on Facebook, this project, Healthy Food for Healthy Life application is being developed to serve readers and users on getting information in a more structured way of displaying contents (Human Computer Interaction), which can be useful for all users.

Social Networking Statistics has shown that Facebook is on the first rank of most popular social network with more than five hundred million users around the world, this application is believe to be useful especially in delivering the information to

users in more interactive way despite beneficial information. From this project, we can see the importance of selecting Facebook Social Network as the application platform and how the issues in interface design can be handling in order to distributing information for the good purpose.

In Healthy food for healthy life application, we can find element on interface design. As mentioned before, in designing interface, it must meet the requirement on HCI in order to achieve technology and functionality of the product. The fundamental goals of HCI are "to develop or improve the safety, utility, effectiveness, efficiency, and usability of systems that include computers" (Porter, 1999, p.3) By having interactive interface design, this application can be more effective in delivering the information to all Facebook users compared to current websites which proving the same information.

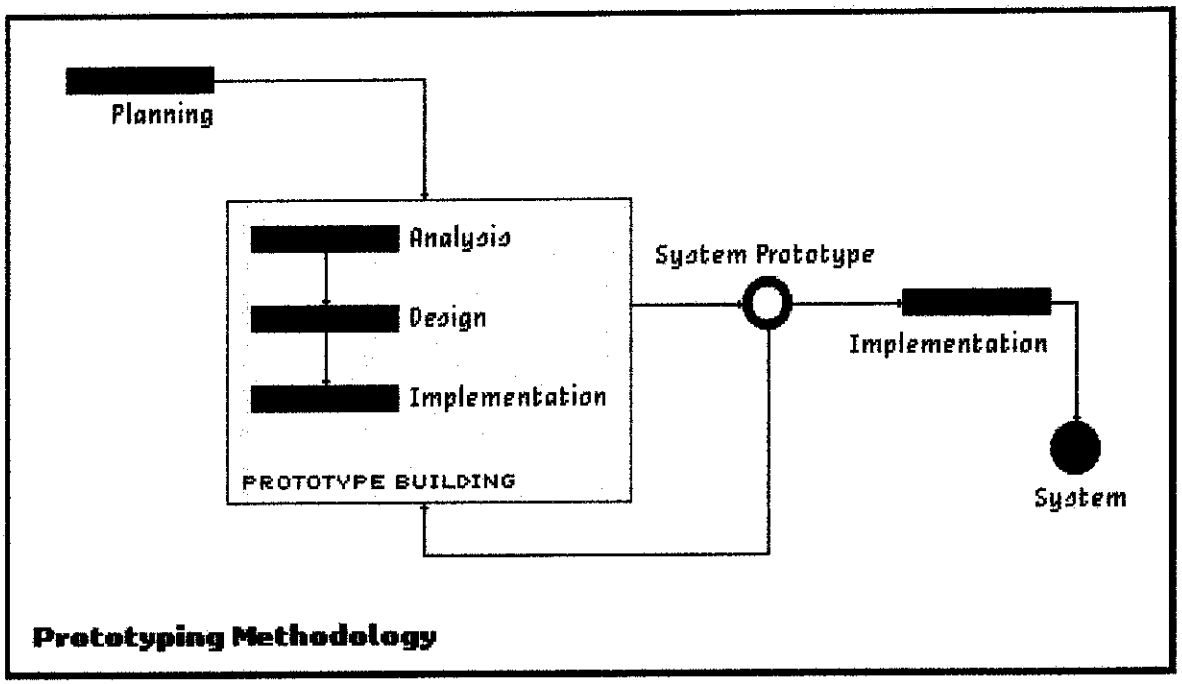
CHAPTER 3

METHODOLOGY

Figure 3.1 Instructional design model (Brenda Mergel (2007))

3.1 METHODOLOGY AND PLANNING PHASE

The methodology that the Author used in this project is prototyping. This methodology consist of planning, analysis, design and implementation phase. During the development of the system, the researcher will create a prototype of the system. This to make sure the system meet the user requirement during the analysis phase and avoid requirement changes during system development. Below are the Prototype Methodology and justifications of the methodology chooses:



Prototyping Methodology

1. Clarity of user requirement

The requirement get from the user sometimes can be misunderstood by the developer. Therefore, in order to make sure the system meet the user requirement, prototyping is one of the best methodologies in researcher point of view as the user can interact with the system's prototype and at the same time received feedback from the user.

2. Short time schedule

The system need to be develops in short time of period. As the time consuming problem, prototyping can be one of the best methodologies as it can help to provide fast end system to the user.

The advantages of this method are it can help to improve quality of requirement, thus save the time during the development of real project as user requirement changes can be avoid. The Author also can obtained feedback from the user during the development of system prototype.

Some of the drawbacks using this method is it might consume more time if the developer too focus on the prototype phase. Therefore, the author will try to make sure it will not take so much time during the prototype phase.

3.2 ANALYSIS

Aim of the research is to design an application; healthy food for healthy life by analysis and considering the suitable Principle of interface design (Human computer interaction). Next is to design and develop the application and finally by implementing and test the usability of the application.

For this study, the following approach was adopted. First, relevant information, publications and studies were reviewed in order to get in-depth information on healthy food in general and obesity disease in particular. Also country the comparison on statistics information on the current top social network was reviewed. The key player of this project is researches on journals, book, health articles, news, trusted website and etc. Finally, the information obtained was analyzed and processed, and checked against information obtained from literature and other sources.

3.2.1 Data Collection

The instructional model (Figure 3.1) on which this study is based; ensure that formative evaluation and data collection takes place at each stage of design, development and implementation.

Method done currently is by researches on journals, case studies, thesis, books, and newspaper articles. \

- **Research**

Research can be defined as a careful and systematic study in some field of knowledge, undertaken to establish facts of principles. (Grinnel, 1997) The primary purpose for applied research is discovering, interpreting, and the development of methods and systems for the improvement of human knowledge on a wide variety of scientific matters of our world.

Researchers have been done for this application. Most of the research area covering are from Journals, Articles, Books, Thesis and trusted websites. In order to come out with an application that meet the requirements of HCI, research on previous thesis, Journals are really beneficial and helpful.

- **Online questionnaire / survey**

A questionnaire is a series of questions asked to individuals to obtain statistically useful information about a given topic. In quantitative marketing research and social research, questionnaires are the most preferable method to be used. They are one of the cheapest and most feasible ways of gathering data from a large number of individuals, often referred to as respondents. Inappropriate questions, incorrect ordering of questions, incorrect scaling, or bad questionnaire format can make the survey valueless

The questionnaire that have been done previously including sixty respondents. They are mix of Men and Women at the age of 17-25 years old. The questions are:

1) Do you have a Facebook account?

2) Do you find any informative application in Facebook or just games?

3) Do you aware on your current body mass index (BMI)?

4) How do you prefer applications in Facebook to be?

5) Do you think current health websites are interesting enough?

6) Would you like to have an interesting informative application in Facebook besides current games applications?

- **Survey using likert scale**

Another survey has been conducted after the development of the prototype has done. The purpose of this survey is to test on users' acceptance of Healthy Food for Healthy Life application. This survey has been conducted on 30 respondents of male and female regardless their field of studies. The questions were tested on users' satisfaction, learnability and consistency. The questions are:

Section 1: Background

1. Gender
   Male____ Female____

2 Have you used any Healthy Food application before?

   YES ___ **NO** ___

3. Please circle the option which would best describe your motivation in using Healthy Food application as reference in taking healthy meals everyday:

Not motivated at all				**Very motivated**
1	2	3	4	5

4. Please circle the option which would best describe your tendency in using any facebook applications every time you logged into your Facebook account, giving 5 is the highest:

Not interested				**Using fb apps regularly**
1	2	3	4	5

Section 2: Evaluation on consistency

1. Is it easy for you to be able to navigate through the application at the first view :

Very difficult **Very easy**

1 2 3 4 5

2. Is it easy for you to get the concept of the application when you first try it :

Very difficult **Very easy**

1 2 3 4 5

3. Are all fonts, colors and buttons consistent and clearly seen:

Very difficult **Very easy**

1 2 3 4 5

4. How are fields and buttons ordered:

Very inappropriately **Very appropriately**

1 2 3 4 5

5. Does each button navigate to the correct screen or page:

Very inappropriately **Very appropriately**

1 2 3 4 5

Section 3: Evaluation on learnability

1. How fast can you grab the concept of the application, eg how to use the application, what to do next, etc:

Very slow **Very fast**

1 2 3 4 5

2. Is it easy for you to understand the concepts (as in Question 1) :

Very difficult **Very easy**

1 2 3 4 5

3. Describe the overall learnability of the application, which is the easiness to use the whole application:

Very difficult **Very easy**

1 2 3 4 5

Section 4: Evaluation on satisfaction

1. Rate the pleasantness of the application interface, such as the design, images used and position of the buttons?

Very unpleasant **Very pleasant**

1 2 3 4 5

2. Rate the pleasantness of the application color to the eye :

Very unpleasant **Very pleasant**

1 2 3 4 5

Section 5: Opinion on research's implementation

1. It is easy to grab the concept while using the apps?

Very difficult **Very easy**

1 2 3 4 5

2. It is easy to remember the information provided?

Very difficult **Very easy**

1 2 3 4 5

3. Rate the interface of the apps, either it is pleasant or not?

Very unpleasant				**Very pleasant**
1	2	3	4	5

4. Rate the research implementation, either it is suitable to be implemented or not?

Very unpleasant				**Very pleasant**
1	2	3	4	5

3.2.2 Determine application's requirement

3.2.2.1 Functional requirement

1. Healthy Food For Healthy Life Application
   1.1 Available to all Facebook users
   1.2 Users can view information on Minerals, Fats. Etc
   1.3 Users also can input weight and height to calculate BMI
   1.4 From the calculated BMI, user will know they fall in which category. (Normal, Overweight or Underweight)
   1.5 User also can see suggestions food from each category to stay healthy.
   1.6 For each category, there will be simple quiz at the end of the page to ensure user really understand on healthy food they should take daily.

3.2.2.2 Non-functional requirement

1. System Performance
   1.1 The systems able to show the result of BMI as soon user hit the button calculate.
   1.2 The system able to show the result of quiz on the spot.

3. 3 DESIGN AND DEVELOPEMENT

At this stage, design of this application has been done by using Adobe Photoshop. Author design the whole page from scratch in order to ensure that the page is interactive and able to attract users who use this application. Since the Author has little knowledge on using Adobe Photoshop software, she decided to design the application by herself. While designing, Author carefully chooses color, pictures that are suitable and ensure the design is simple and yet attractive.

Besides that, Author also need to carefully create a design that follows the HCI requirements by using the Schneiderman's 8 Golden Rules interface design. To improve the usability of an application, it is important to have a well designed interface. Shneiderman's 8 Golden Rules are a guide to good interaction design.

1) Strive for consistency.

2) Enable frequent users to use shortcuts.

3) Offer informative feedback.

4) Design dialog to yield closure.

5) Offer simple error handling.

6) Permit easy reversal of actions.

7) Make Users Feel they are in Control of a Responsive System

8) Reduce short-term memory load.

3.4 GANTT CHART AND KEYMILESTONES

	FYP 1 and FYP 2 (May - December 2011)							
ACTIVITIES	31 May – 20 June	21 June – 1 July	2 July – 12 Aug	14 Aug – 20 Sept	22 Sept – 30 Oct	1 Nov – 23 Nov	21 Nov – 9 Dec	10 Dec – 20 Dec
Study and research on Principles of Interface design in Human Computer Interaction (HCI).								
Research on current Obesity fact worldwide and in Malaysia.								
Research current Facebook tendency on types of applications.								
Gathering online information form monkey online survey regarding how user prefers this application would be. Ie: Words, Words + pictures etc.								
Plan project design based on respondents' result from previous survey.								
System development such as designing part, color chosen, selecting daily food menus and etc.								
Conduct User Acceptance Test (UAT) on 30 random respondents (Men and Women)								
Analysis and discussion								
Research documentation								

	FYP 1 and FYP 2 (May - December 2011)							
MILESTONES	31 May – 20 June	21 June – 1 July	2 July – 12 Aug	14 Aug – 20 Sept	22 Sept – 30 Oct	1 Nov – 23 Nov	21 Nov – 9 Dec	10 Dec – 20 Dec
Identify suitable modification on current applications								
Finalized system requirement and designs								
Completion on development								
Completion on testing								
Completion of result analysis								
Project completion								

CHAPTER 4

RESULT AND DISCUSSION

4.1 Findings

Available data are significant findings on the surveys. The respondents are forty-five students from Universiti Teknologi Petronas and fifteen are from different local Universities and they are from various areas of field in studies. These findings illuminate the issues regarding this Final Year Project topic, which is Healthy food for Healthy Life, Facebook application.

On the whole, current data indicates that this final year project is relevant to be done as people are less conscious on their BMI, hence potentially brings to overweight, agrees that current healthy food websites are less interesting and Facebook only focuses more on game applications which is less on informative applications to educate people on Health. The following are findings that have helped frame this FYP.

Response Summary

Total Started Survey: 60
Total Completed Survey: 60 (100%)

PAGE: 1

1. Do you have Facebook account? Create Chart Download

	Response Percent	Response Count
Yes	95.0%	57
No	5.0%	3
answered question		60
skipped question		0

2. Do you find any informative application in Facebook or just games? Create Chart Download

	Response Percent	Response Count
Informative apps	60.0%	36
Games apps	61.7%	37
answered question		60
skipped question		0

3. Do you aware of your current body mass index (BMI) ? Create Chart Download

	Response Percent	Response Count
Yes	23.3%	14
No	76.7%	46
answered question		60
skipped question		0

4. How do you prefer informative application in Facebook to be? Create Chart Download

	Response Percent	Response Count
Detailed description with picture	53.3%	32
Fun short quizes	70.0%	42
answered question		60
skipped question		0

5. Do you think current health websites are interesting enough? Create Chart Download

	Response Percent	Response Count
Yes	16.7%	10
No	43.3%	26
Not sure	40.0%	24
answered question		60
skipped question		0

6. Would you like to have an interesting informative application (short quiz) in Facebook besides current Facebook games application? Create Chart Download

	Response Percent	Response Count
Yes	85.0%	51
No	15.0%	9
answered question		60
skipped question		0

4.2 Data Gathering

According to the questionnaire, question 1 show that majority (95%) of the respondents have at least one Facebook account, 5.0 % of the respondents' do not have any.

Furthermore, question 2 demonstrate more than half (61.7%) agrees that most of Facebook applications are on Games and about 60% agrees Facebook also provides informative applications.

Moreover, not many of the respondents really aware on their current Body Mass Index (BMI) which is resulting in 76.7% and only about 23.3% of them really aware on their BMI.

Question 4 enquires respondents' opinion on how they prefer applications on Facebook would be. About 70% prefer the applications would be fun short quizzes compare to detailed description with pictures (53.3%)

When asked on respondents' opinions on current Health websites, 43.3% of them agree that the websites are not interesting hence they have not interested in visiting any. About 40% of the respondents are not sure and only 16.7% disagree that current Health websites are not interesting and well educate the readers.

In determining the interests of Facebook users, Question 6 shows that majority (85%) think that Facebook should have informative application despites the current applications which are more towards games and minority (15%) disagree.

Based on the results we can say that Healthy Food for Healthy Life application for Facebook is applicable to be done as Final Year Project based on the results of the survey.

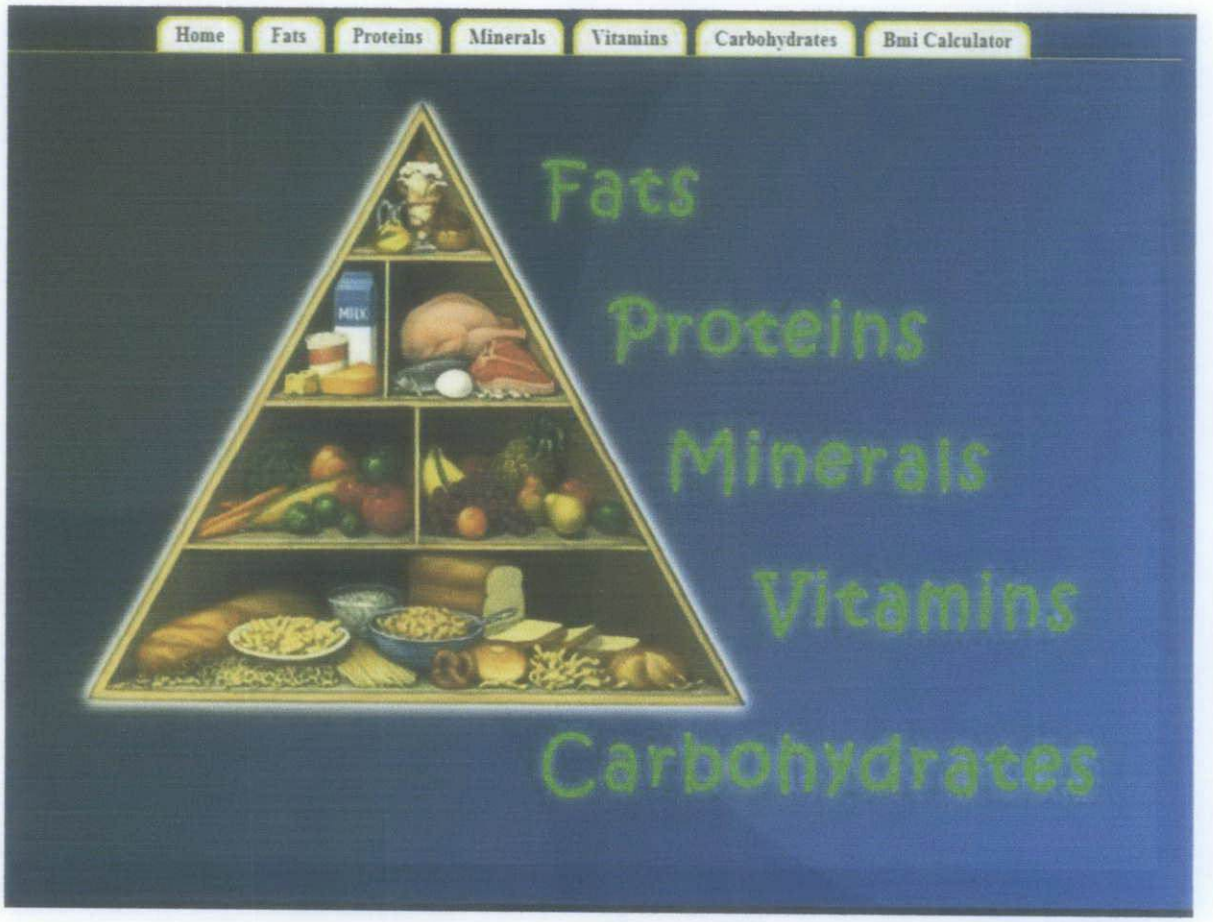
4.3 Prototype

The prototype of this system has completed and review by the user which are Assoc. Prof. Dr. Wan Fatimah Binti Wan Ahmad and other 29 users regardless male and female. After the prototype has done, the Author conducted User Acceptance Result on random Facebook users between 20 years to 40 years old, regardless their gender Male and Female.

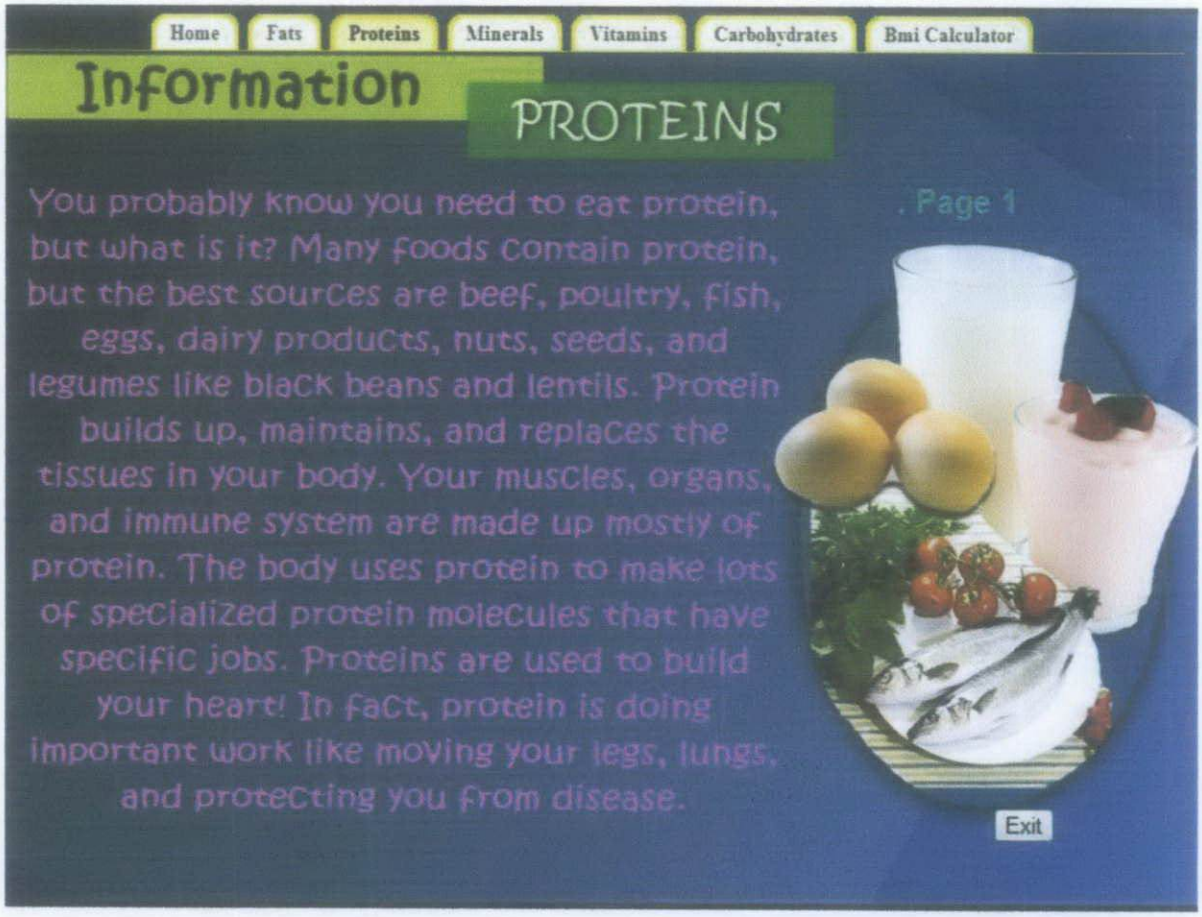
4.3.1 Prototype Explanation

This is the welcoming page that will appear when user goes to this application page. The design is very simple and the developer chooses vegetables and fruits as the picture because they signify healthy food. Besides the greetings "Welcome", it also display the name of this application clearly in order to inform user that they are on

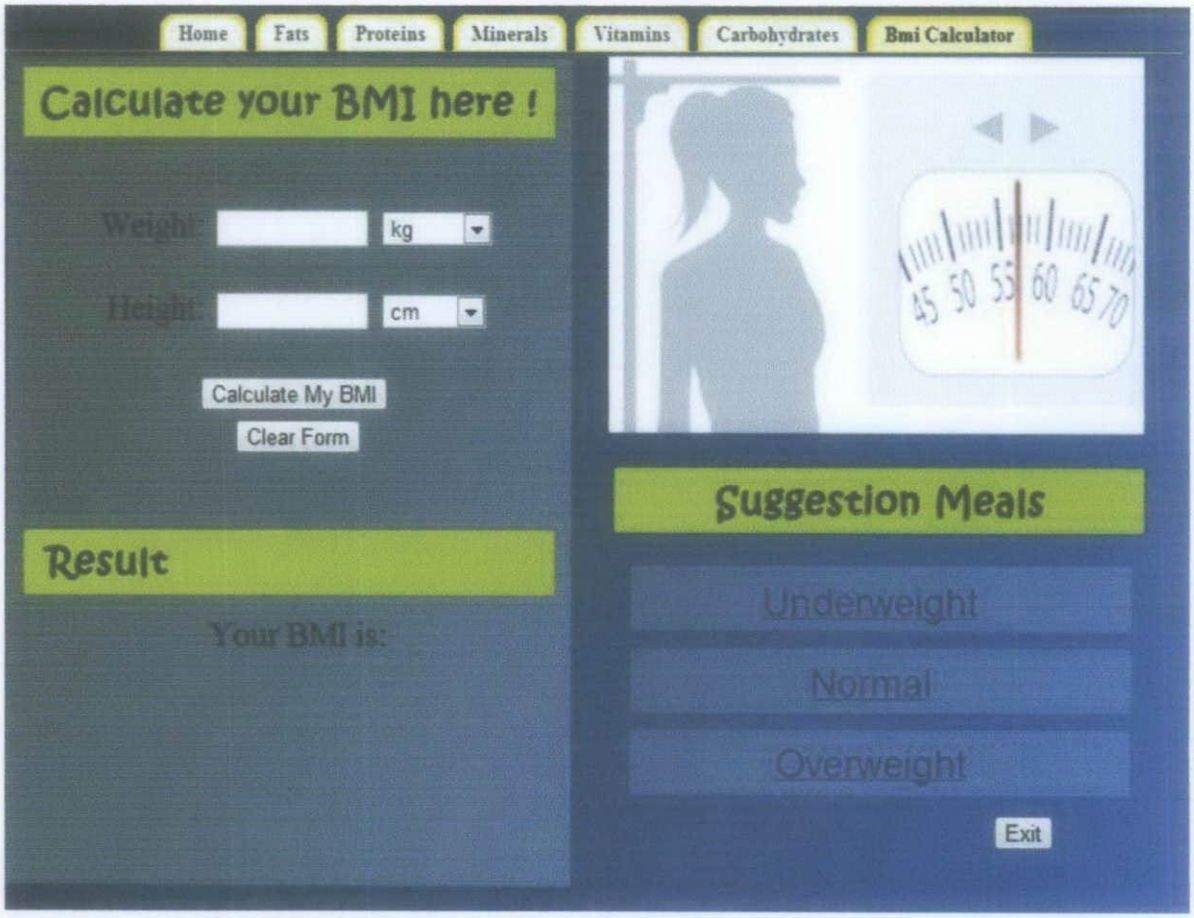
the correct page. The proceed button is at the below right on the page and this will link user to the second page as below.



The above screenshot is the second page that will allow user to choose on preferred page they wanted to visit from the menu tab at the top of the page. There are Home, Fats, Proteins, Minerals, Vitamins, Carbohydrates and Bmi Calculator menu tab. If user clicks on the Proteins tab, user will redirect to the Proteins page. And at the page, the Protein tab will change color to yellow. This indicates that user is currently on Proteins page. The screenshot is as below:

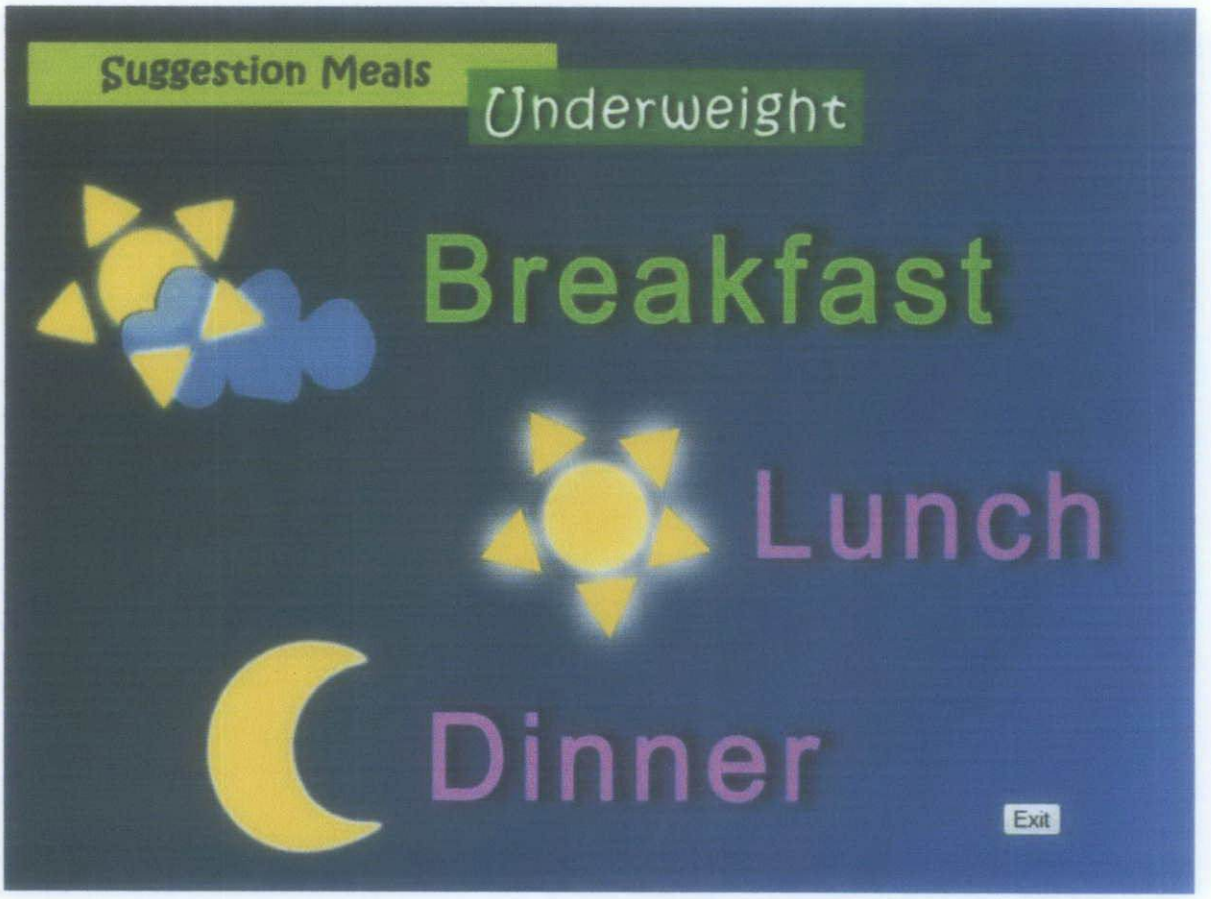


The Proteins tab is now at yellow color, this means that the user is currently at the Proteins page. Besides that, there is also indicator that tells user currently at Page 1. If the information is too long, there will be Next button at corner right bottom of the page. When user clicks on the Next button, user will go to the continuation of the information on protein at page 2. Since Protein only requires one page for the information, thus, there is no Next button or Page 2. The only button that this page has is the Exit button. After finishes read the information, user can hit the Exit button and user will be directed to the second page earlier.



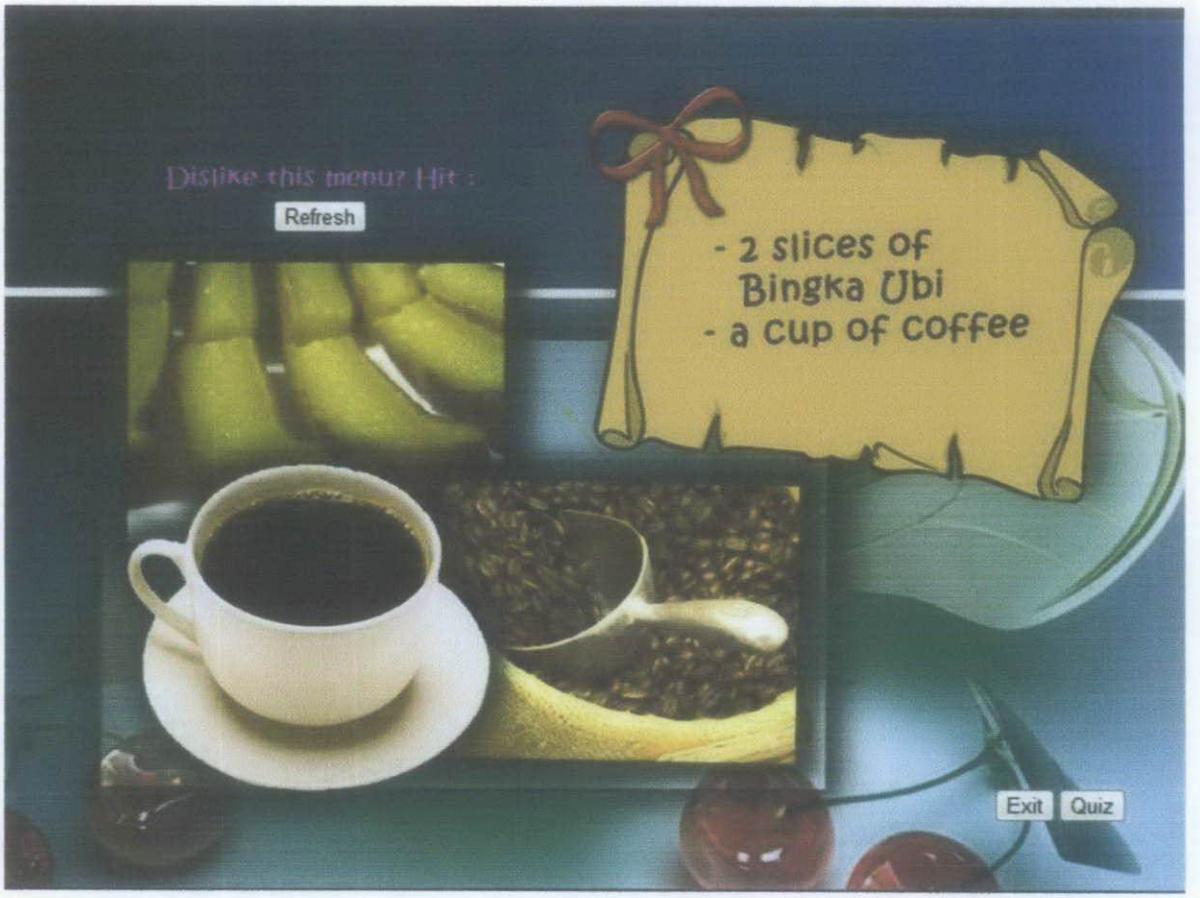
As we can see on the menu tab above, currently the user is at the BMI Calculator page. On this page, user needs to enter the weight in kilograms and height in centimeter. Then, hit the Calculate My Bmi button. In the result section, user will know the outcome whether underweight, normal or overweight.

On the right side, there are links; Underweight, Normal and Overweight. User is allow selecting on any links and will get directed to the next page. For example, from the calculated BMI, the user is Underweight. Hence, user is advisable to click on the Underweight category of suggestion meals. Other than that, there is also Exit button that will redirect user out from this page.



As the result from clicking the Underweight link above, user is now on the suggestion meals for Underweight category. At this page, user has choices to select Breakfast, Lunch or Dinner to get the recommended meals. For example, select Breakfast.

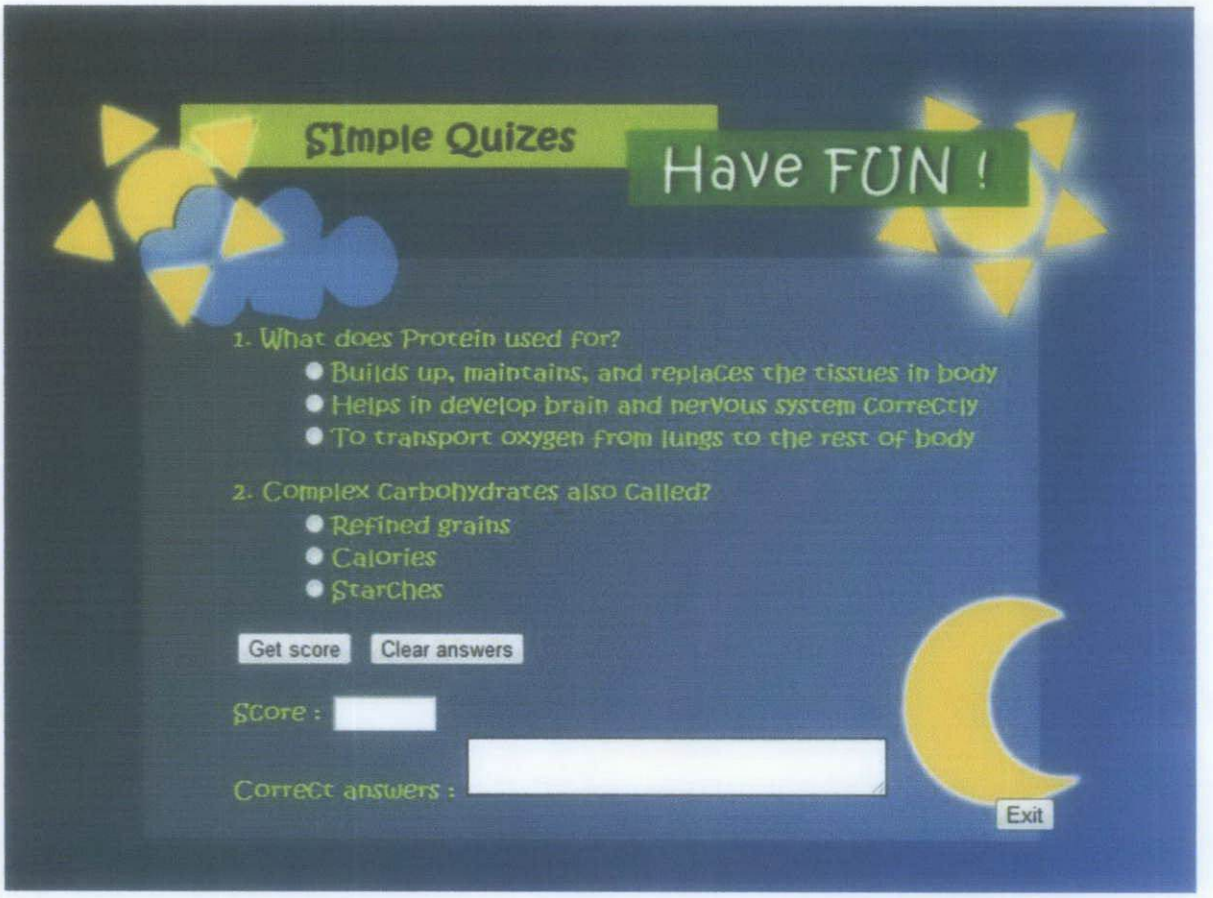
When user put the cursor on Breakfast, Lunch or Dinner, the color of the wording will change from pink to green. Developer decided to use this idea to make the page more colorful and more interesting. This idea is call on-mouse event which is in Javascript style. Last but not least, at the bottom right of the page, there is an Exit button which allow user to get back to the main page.



This is the example on suggestion meals for breakfast, underweight category. The developer gets this meal from the calculated calories needed by people who are Underweight. There are certain amount of calories that user should take daily in order to stay healthy.

There is a refresh button at the top left. The purpose of this button is to allow user to choose other menu for breakfast if he/she dislike the menu. There are few menus that the developer has created in case users dislike them.

At the bottom corner on the right hand side of the page, there are Exit button and Quiz button. The Exit button will brings user to the main page upon a single click and the Quiz button will brings user to Quiz page.



Finally, the last page is the quiz section. There are several quizzes that the developer has created. Users need to answer this quiz to ensure that they really understood what they have read from the information earlier on. There is a Get Score button that will allow user get the total score they get from the answered questions above. Clear Answer button is to clear all the answer that user has selected before.

Under the Score, there is another field that will provide users with the correct answer. From here, user will know the correct answer for the quiz without needed them to go back to the information page and search one by one. This will make the user's life easier as the can know the correct answer immediately. Finally is the Exit button. This will bring users back to the main page.

4.4 User Acceptance

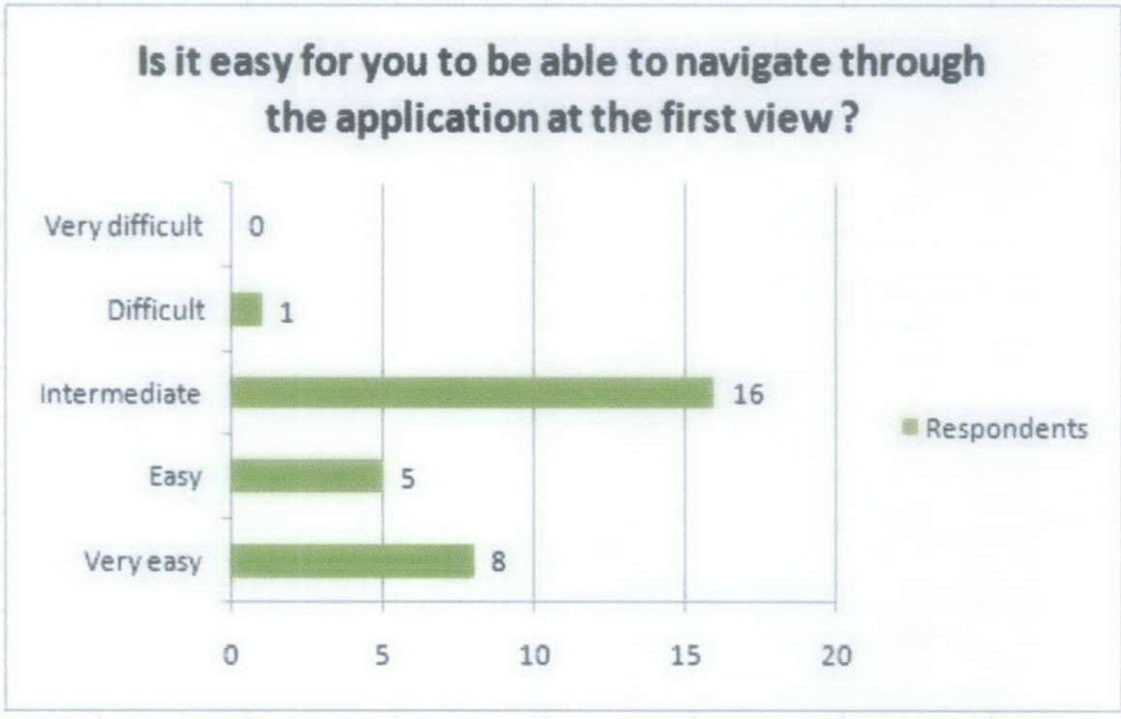
User Acceptance Testing is often the final step before continuing the real application. Usually the end users who will be using the applications test the application before accepting it. Besides that, this testing is also helps in fixing bugs related to usability of this application. The purpose of testing the application is to assure that the entire application is functioning correctly as well as the user interface such as all of the Menus and Graphical Interface buttons pull down lists, scrolling lists, and check boxes are performing correctly.

4.4.1 User Acceptance Test result

Healthy Food for Healthy Life application was tested under three categories which are *consistency, learnability* and also *satisfaction*. Thirty respondents, male and female were tested the application and the results are as below:

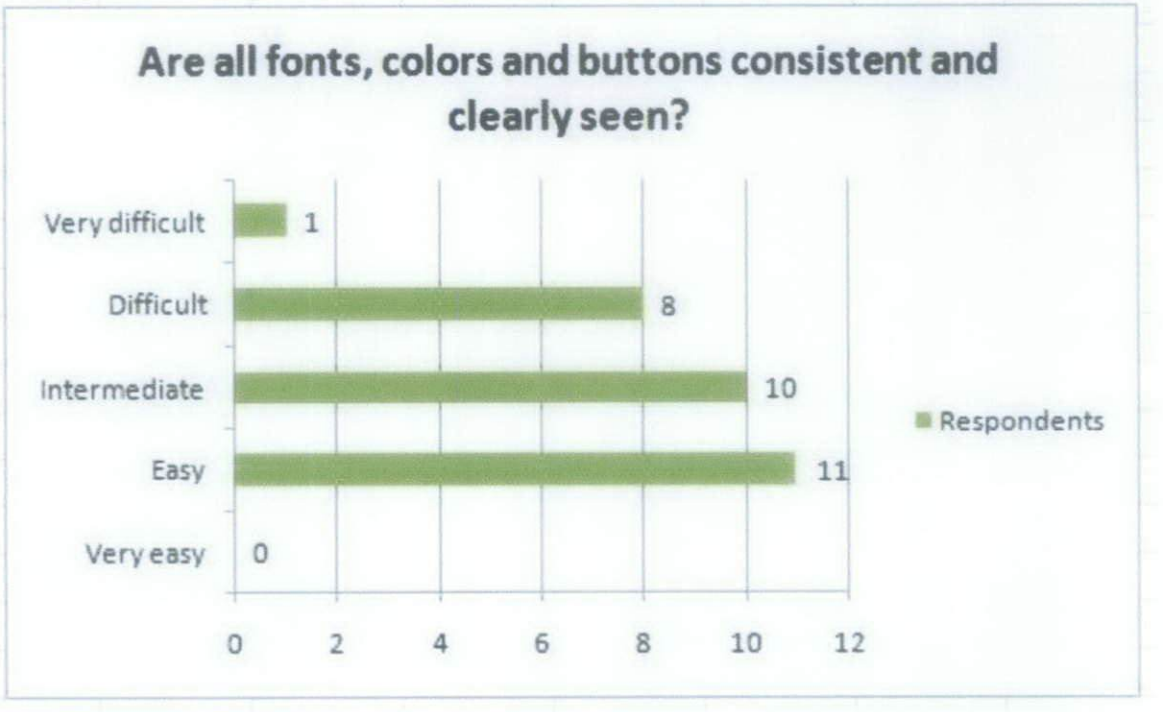
4.4.1.1 Consistency

Question 1

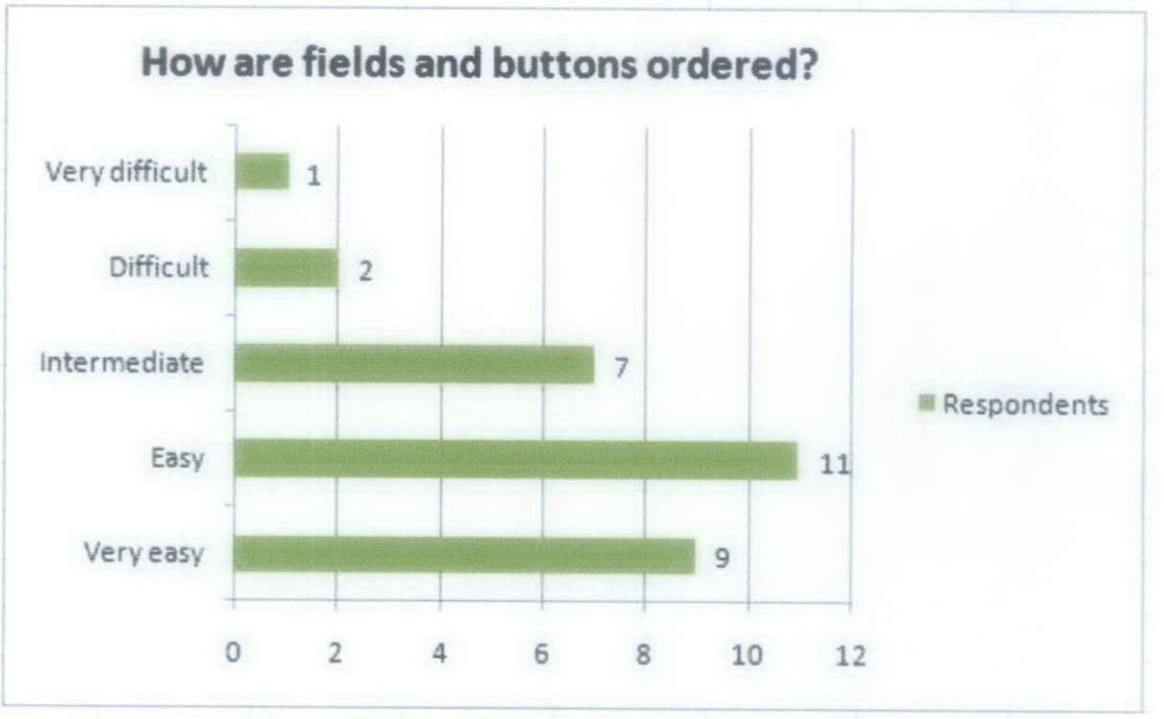


Question 2

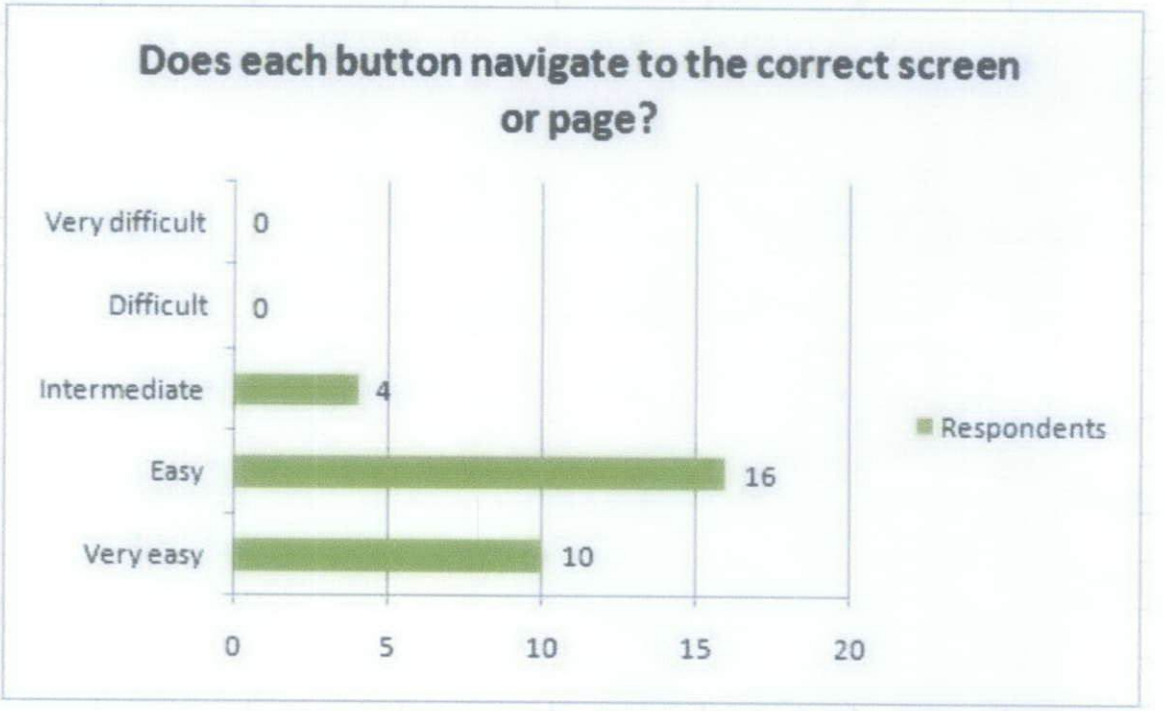
Question 3



Question 4

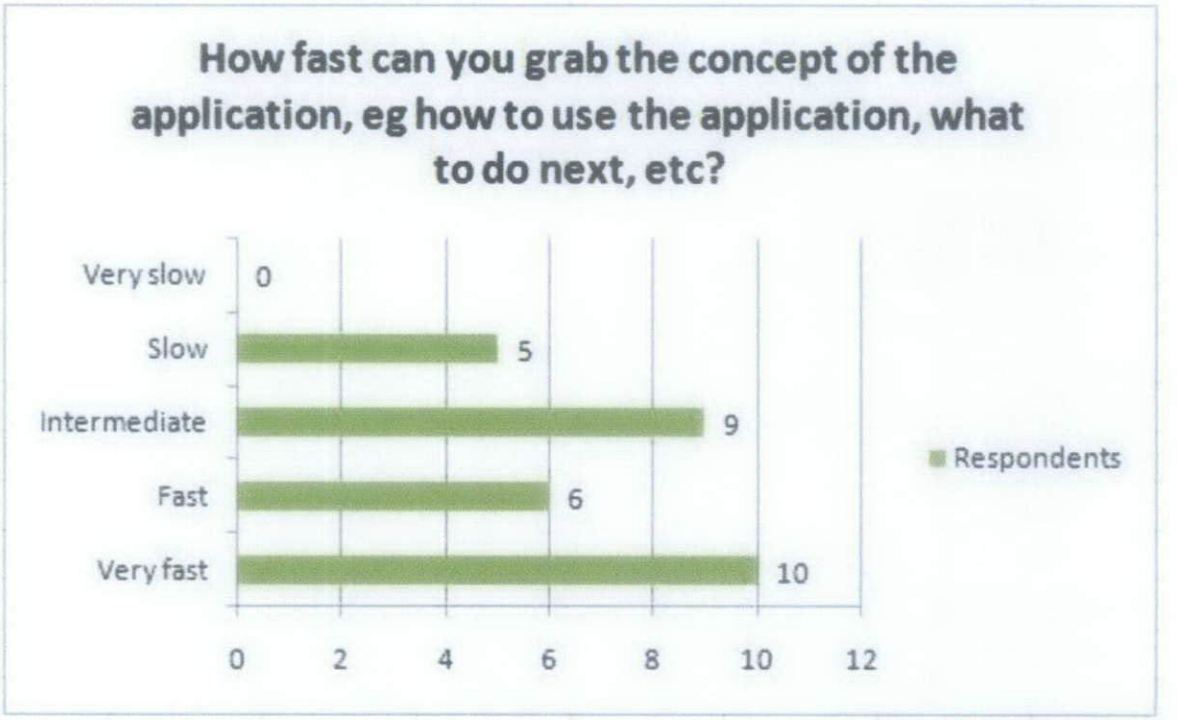


Question 5

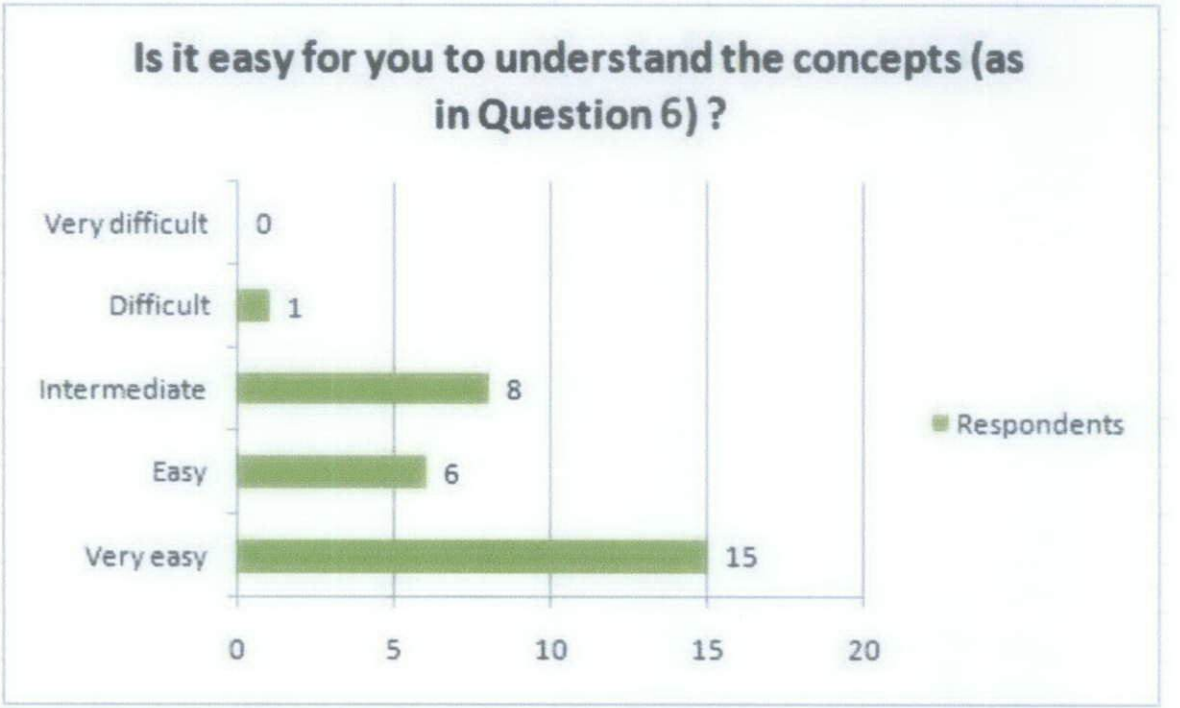


4.4.1.2 Learnability

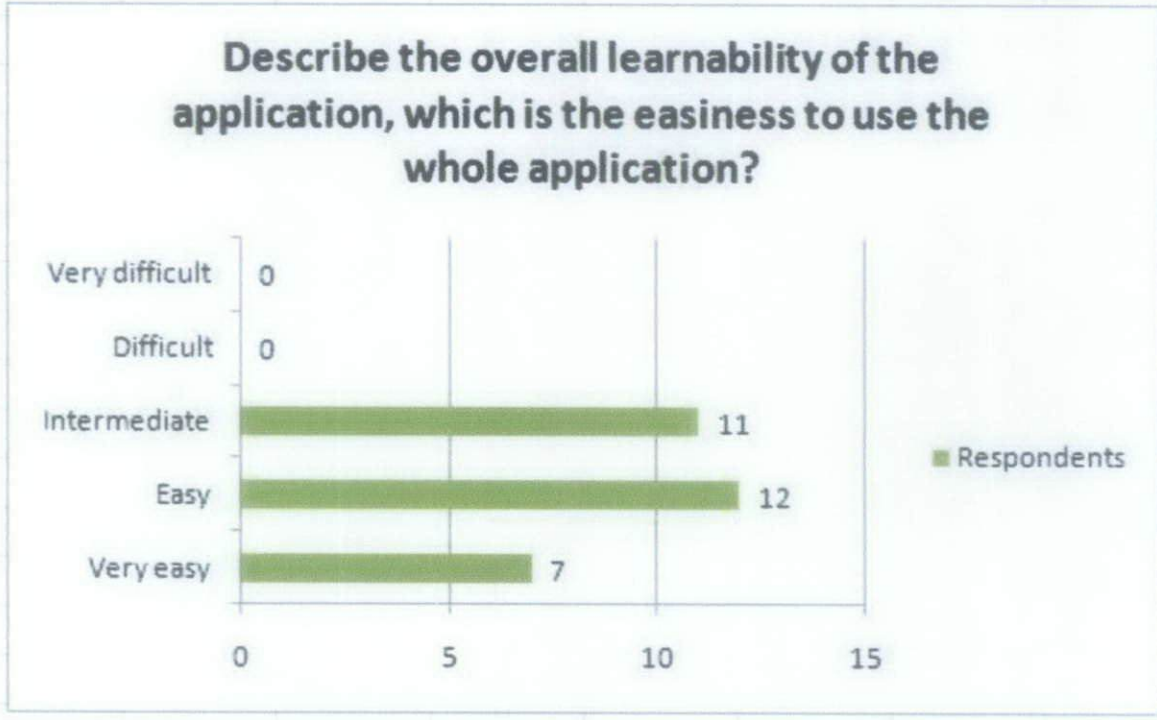
Question 6



Question 7

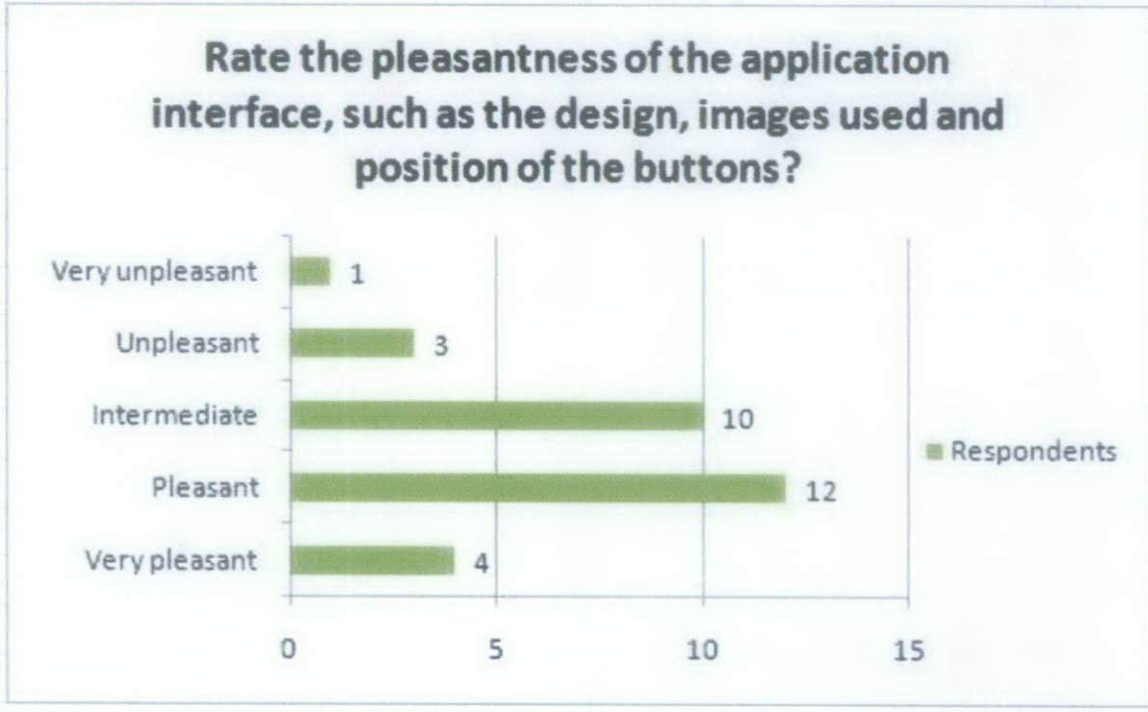


Question 8

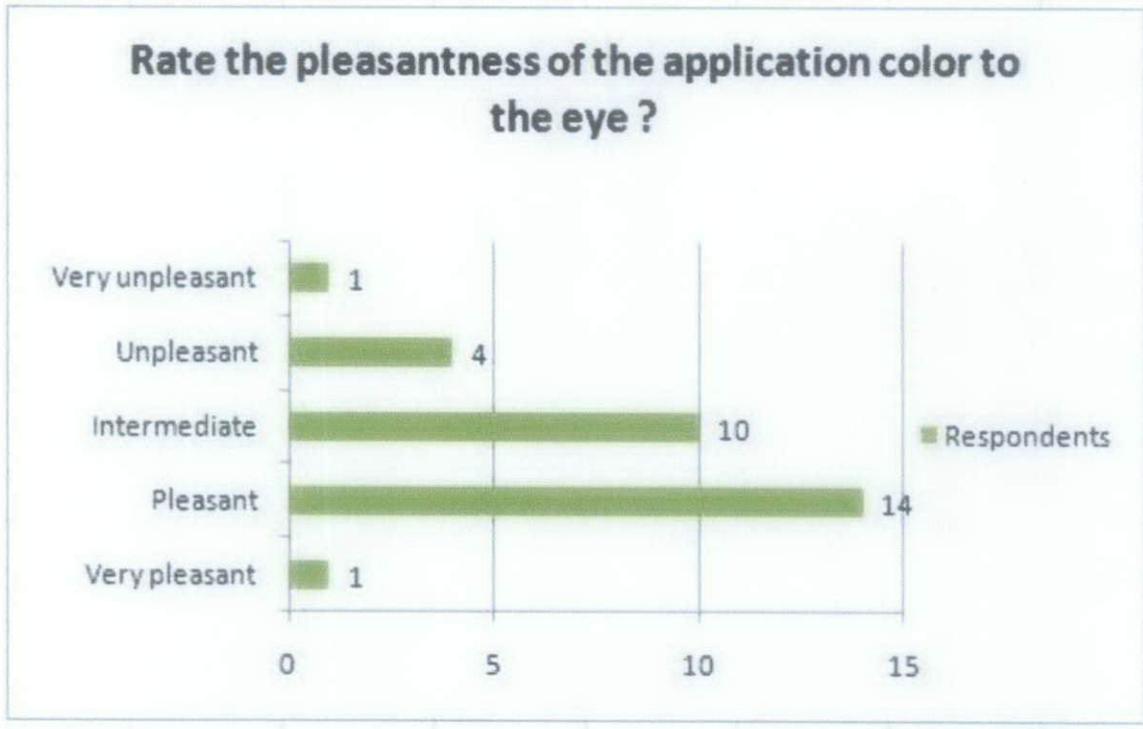


4.4.1.3 Satisfaction

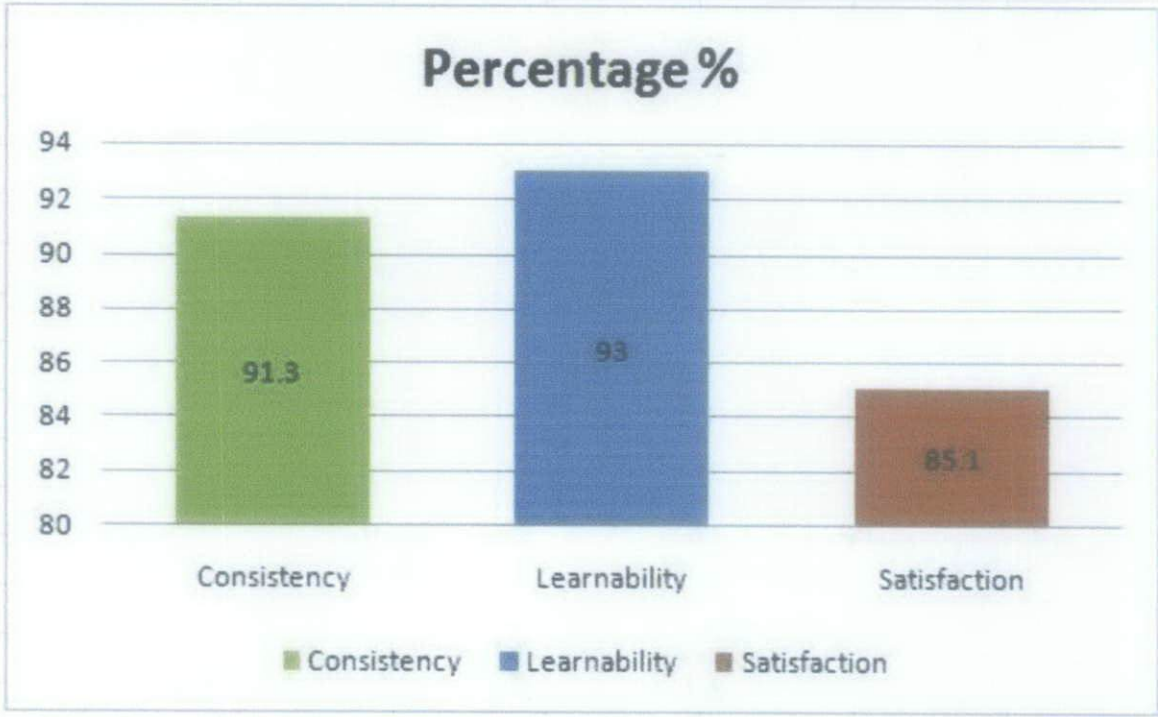
Question 9



Question 10



4.4.1.4 Overall percentage on Consistency, Learnability and Satisfaction



4.5 Source code

4.5.1 Information Page i.e : Proteins

```
<head>
<meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
<title>Healthy Food For Healthy Life</title>
<style type="text/css">
body {
	background-color: #000000;
	background-image:url(wall/pro.jpg);
	background-repeat: no-repeat;
	background-attachment:fixed;
	background-position:center;
	text-align:center;
}
body,td,th {
	font-size: 18px;

.div1
{
	font-size: 20px;
	font-family:"Kristen ITC",Arial,sans-serif;
	//background-color:#FFFFFF;
	color: #F834F5;
	font-weight: bold;
	float:left;
	width:470px;
	height:240px;
	position:absolute;
	left:330px;
	top:170px;
}

.divPg
{
	font-size: 20px;
	font-family: Arial,Helvetica,sans-serif;
	color: #00FFBF;
	font-weight: bold;
	float:left;
	width:400px;
	height:240px;
		position:absolute;
	left:720px;
	top:170px;
}

.divEx
{

	float:right;
	width:350px;
	height:50px;
	position:absolute;
	left:750px;
	top:560px;
```

```
}
-->
</style>
</head>
<body>

<div class="div1">
You probably know you need to eat protein, but what is it? Many foods contain protein, but the best sources are beef, poultry, fish, eggs, dairy products, nuts, seeds, and legumes like black beans and lentils. Protein builds up, maintains, and replaces the tissues in your body. Your muscles, organs, and immune system are made up mostly of protein. The body uses protein to make lots of specialized protein molecules that have specific jobs. Proteins are used to build your heart! In fact, protein is doing important work like moving your legs, lungs, and protecting you from disease.
</div>


<div class="divEx">
<FORM METHOD="LINK" ACTION="satu.html">
<INPUT TYPE="submit" VALUE="Exit">
</FORM>
</div>

<div class="divPg">
. Page 1
</div>
</body>
</html>
```

4.5.2 Bmi Calculator

```
<script type="text/javascript">

function calcBMI(){

// Get Variables and validate to make sure they're numbers,
// setting them to a value of 1 if they're not.

var weight = (isNaN(document.wcbubba.weight.value)) ? 1 :
document.wcbubba.weight.value;
if (weight == 0) alert("Results will be inaccurate. Weight is not a
valid number.");
var height = (isNaN(document.wcbubba.height.value)) ? 1 :
document.wcbubba.height.value;
if (height == 0) alert("Results will be inaccurate. Height is not a
valid number.");

// set multipliers based on whether metric or English units were
selected

var wmult = (document.wcbubba.units.value == "pounds") ? 2.204 : 1;

// Turns inches/centimeters into meters
```

```
var hmult = (document.wcbubba.hunits.value == "inches") ? .0254 : .01;

// Do the calculation (weight in kg divided by the height in meters
// times itself). The multiplication by 10 and then division by ten
// work in conjunction with Math.round() to round the value to one
// decimal place of precision.

var BMI = Math.round(((weight / wmult)/((height * hmult)*(height *
hmult))) *10)/10;

var result = "";
if(BMI < 16.5) result = "SEVERELY UNDERWEIGHT";
else if((BMI >=16.5)&&(BMI<=18.49)) result = "UNDERWEIGHT";
else if((BMI >=18.5)&&(BMI<=25)) result = "NORMAL";
else if((BMI >=25.01)&&(BMI<=30)) result = "OVERWEIGHT";
else if((BMI >=30.01)&&(BMI<=35)) result = "OBESE";
else if((BMI >=35.01)&&(BMI<=40)) result = "CLINICALLY OBESE";
else result = "MORBIDLY OBESE";

document.getElementById('results').innerHTML = "Your Body Mass Index
(BMI) is: <br> " + BMI + ".<br><br>This would be considered: <br> " +
result + "";
}
</script>
</head>

<body>
<div class="div3">
<p class="style1"><span class="style4">

<form name="wcbubba" id="wcbubba" action="javascript:void()">
<br>

Weight: <input type=text name="weight" size="10"> <select
name="units"><option value="kilos">kg<option
value="pounds">pounds</select><br><br>

Height: <input type=text name="height" size="10"> <select
name="hunits"><option value="cm">cm<option
value="inches">inches</select><br><br>

<input type="submit" value="Calculate My BMI" onClick="calcBMI();">
<br>
<input type="reset"  value="Clear Form">
</form>
<br>
```

4.5.3 Show random food suggestions i.e Breakfast for Normal

```
<SCRIPT LANGUAGE="JavaScript">

theImages[0] = 'food/Normalbfast1.jpg'
theImages[1] = 'food/Normalbfast2.jpg'
theImages[2] = 'food/Normalbfast3.jpg'
theImages[3] = 'food/Normalbfast4.jpg'


var j = 0
var p = theImages.length;
var preBuffer = new Array()
for (i = 0; i < p; i++){
   preBuffer[i] = new Image()
   preBuffer[i].src = theImages[i]
}
var whichImage = Math.round(Math.random()*(p-1));
function showImage(){
document.write('<img src="'+theImages[whichImage]+'">')
}

//  End -->
</script>
</HEAD>

<BODY>
<div class="div1">
<SCRIPT LANGUAGE="JavaScript">

showImage();
</SCRIPT>
```

4.5.4 Quiz i.e Set 1

```
<script language="JavaScript">
// Insert number of questions
var numQues = 2;

// Insert number of choices in each question
var numChoi = 3;

// Insert number of questions displayed in answer area
var answers = new Array(2);

// Insert answers to questions
answers[0] = "Builds up, maintains, and replaces the tissues in body";
answers[1] = "Starches";

function getScore(form) {
  var score = 0;
  var currElt;
  var currSelection;
  for (i=0; i<numQues; i++) {
```

```
    currElt = i*numChoi;
    for (j=0; j<numChoi; j++) {
      currSelection = form.elements[currElt + j];
      if (currSelection.checked) {
        if (currSelection.value == answers[i]) {
          score++;
          break;
        }
      }
    }
  }
  score = Math.round(score/numQues*100);
  form.percentage.value = score + "%";
  var correctAnswers = "";
  for (i=1; i<=numQues; i++) {
    correctAnswers += i + ". " + answers[i-1] + "\r\n";
  }
  form.solutions.value = correctAnswers;
}
</script>
</HEAD>

<BODY>
<div class="div1">
<form name="quiz">
1. What does Protein used for?
<ul style="margin-top: 1pt">
      <input type="radio" name="q1" value="Builds up, maintains, and
replaces the tissues in body">Builds up, maintains, and replaces the
tissues in body</li>
  <br><input type="radio" name="q1" value="Helps in develop brain and
nervous system correctly">Helps in develop brain and nervous system
correctly </li>
  <br><input type="radio" name="q1" value="To transport oxygen from
lungs to the rest of body">To transport oxygen from lungs to the rest
of body</li>
</ul>

2. Complex carbohydrates also called?
<ul style="margin-top: 1pt">
      <input type="radio" name="q2" value="Refined grains">Refined
grains</li>
  <br><input type="radio" name="q2" value="Calories">Calories</li>
  <br><input type="radio" name="q2" value="Starches">Starches</li>
</ul>

<input type="button" value="Get score" onClick="getScore(this.form)">
<input type="reset" value="Clear answers">
<p> Score : <strong><input class="bgclr" type="text" size="5"
name="percentage" disabled></strong><br>
Correct answers :
<textarea class="bgclr" name="solutions" wrap="virtual" rows="2"
cols="30" disabled>
</textarea>
</form>
</div>
```

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 Relevancy of objective

For the first objective which is to develop an application from suitable principle that can apply in designing interface, Schneiderman's 8 Golden rules have been selected by the developer. The principles such as strive for consistency, easy reversal and reduce memory load has been applied in this project. At the end of the day, a user acceptance test (UAT) will be conducted to random users to test on the consistency, learnability and also satisfaction when they are using this application. Hence, this will prove the result of relevancy of the objective.

According to the survey results, majority of the respondents (95%) have at least a Facebook account, 61.7% of them find out that most the applications are on Games (61.7%). More than half of them which carries 76.7% do not aware on their current Body Mass Index (BMI), and about 70% would like Facebook applications are on fun short quizzes instead of detailed description with pictures. About 43.3% of them agreed that current Health websites are not interesting enough and hence 85% of the respondents would like to have a Facebook application to be on informative despite current apps which are on Games.

At the last stage, User Acceptance Test (UAT) has been conducted in order to ensure that this application is meeting the HCI principles on consistency, learnability and also satisfaction. As the result, the respondents answered 91.3% of the application is consistent, 93% learnability and 85.1% satisfaction.

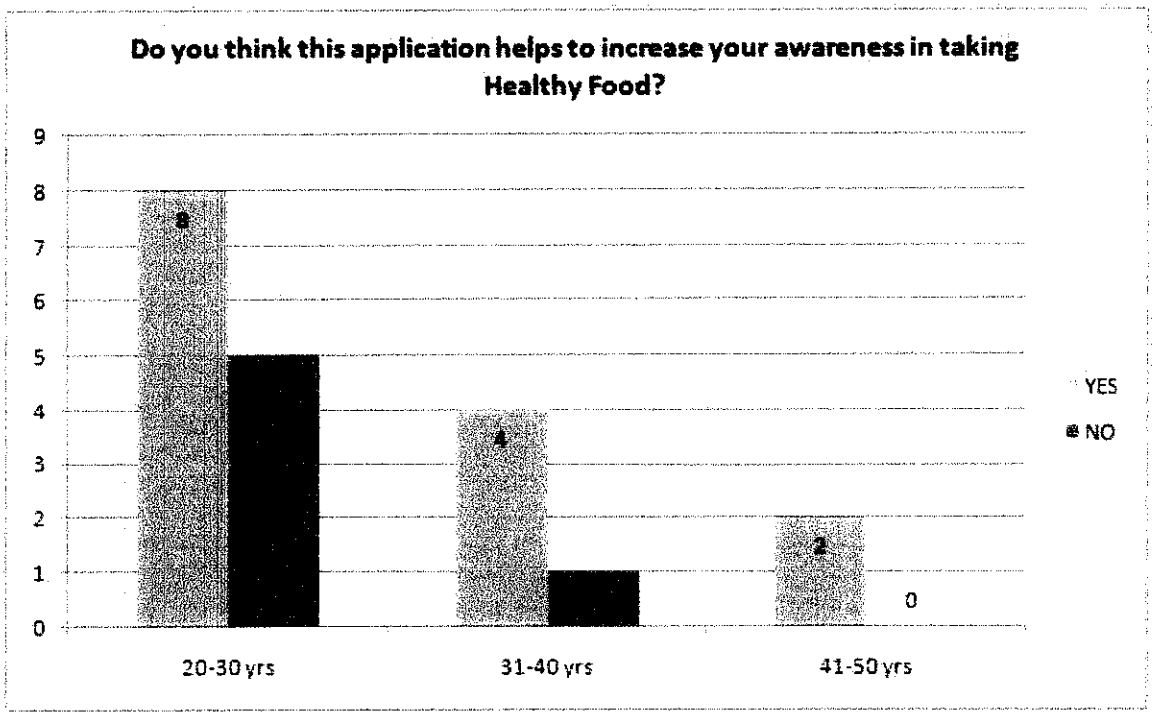
Therefore, there are relevancies of the objectives and Healthy Food for Healthy Life app for Facebook is applicable to be done as a Final Year Project based on the surveys that have been conducted and the surveys' result.

5.2 Conclusions

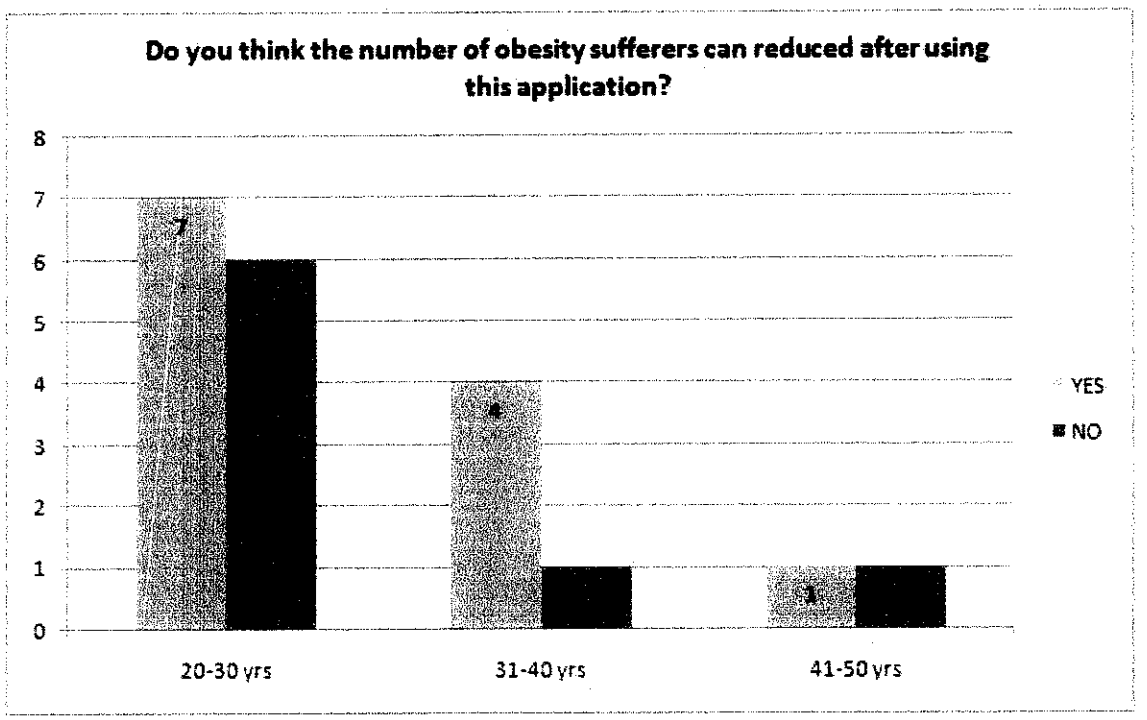
As the time goes by, the number of people affected with overweight are become bigger and the disease becoming more complex (Obesity). This is because on lack awareness on taking daily meals in life every day. Besides that, people also have least interest to visit website that provide information on healthy food. This may be the result from less attractive websites that produces the information. Therefore, the researcher decided to proceed this Final Year Project on Healthy Food for Healthy Life application because she believes that in order to spread important information regarding health, the presentation should be simple but informative, interesting and able to attract Facebook users to use this application, Hence, information can be deliver successfully.

As the result for the project, the researcher found that this application can help to improve the awareness of people in taking healthy food and also few modifications can also be done in order to make it more acceptable and give more effects as the future work based on the below result of survey conducted:

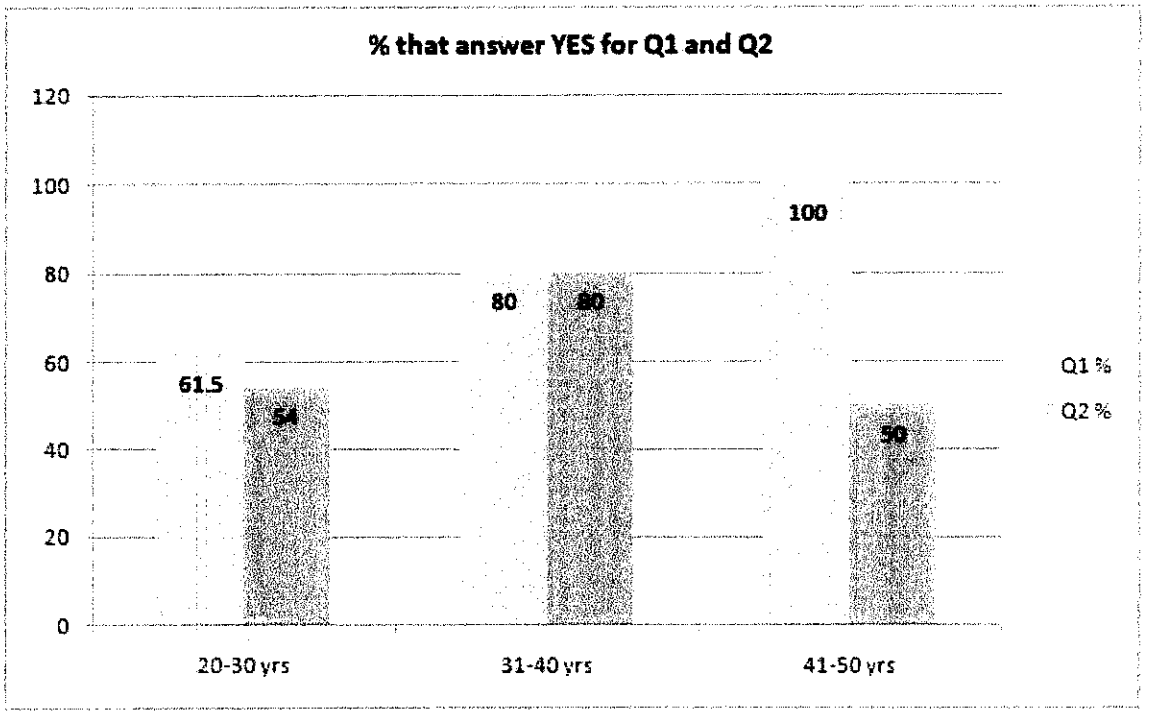
Question 1:



Question 2:



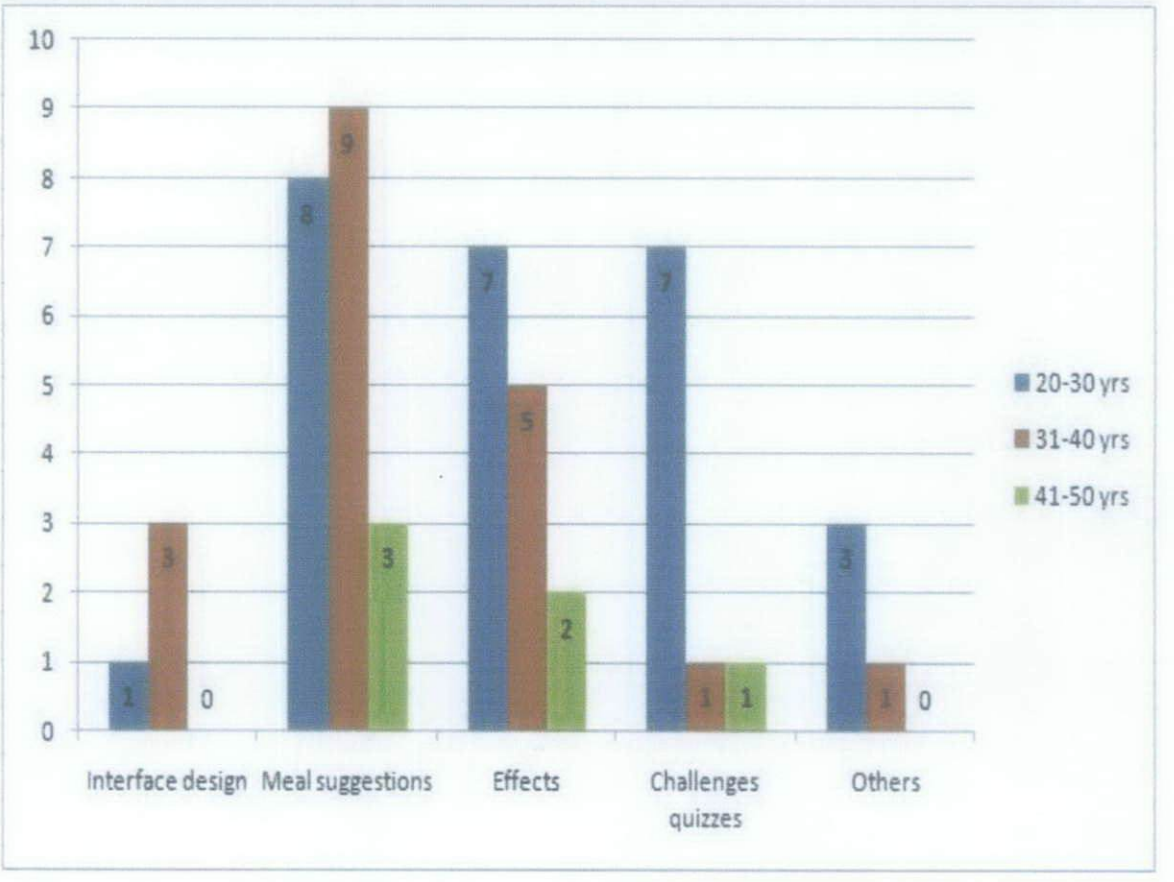
Percentage of respondents answers YES for question 1 and question 2:



5.2.1 Recommendations

In future, there are few improvements that can be done based on the survey results such as create more attractive interface design and effect, more food suggestions for each category and finally create more challenges quizzes. By having better improvement for this application, it may attract more and more users not only in Malaysia, but throughout the world. Hence increase people awareness on taking healthy meal everyday and also reduce the number of obesity disease worldwide.

Future work improvements:



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APPENDICES

Questionnaire – User Acceptance Test (UAT)

Topic: Healthy Food for Healthy Life

Intro

This questionnaire is intended in providing the researcher valuable information regarding the application. This questionnaire will be evaluating respondent opinion with regards to:

1. The usability of the application developed which will be divided into three main categories, which are consistency, learnability and satisfaction.

Section 1: Background

1. Gender

   Male____ Female____

2 Have you used any Healthy Food application before?

   YES ___ **NO** ___

3. Please circle the option which would best describe your motivation in using Healthy Food application as reference in taking healthy meals everyday:

Not motivated at all				**Very motivated**
1	2	3	4	5

4. Please circle the option which would best describe your tendency in using any facebook applications every time you logged into your Facebook account, giving 5 is the highest:

Not interested				**Using fb apps regularly**
1	2	3	4	5

Section 2: Evaluation on consistency

1. Is it easy for you to be able to navigate through the application at the first view :

Very difficult				**Very easy**
1	2	3	4	5

2. Is it easy for you to get the concept of the application when you first try it :

Very difficult				**Very easy**
1	2	3	4	5

3. Are all fonts, colors and buttons consistent and clearly seen:

Very difficult				**Very easy**
1	2	3	4	5

4. How are fields and buttons ordered:

Very inappropriately				**Very appropriately**
1	2	3	4	5

5. Does each button navigate to the correct screen or page:

Very inappropriately				**Very appropriately**
1	2	3	4	5

Section 3: Evaluation on learnability

1. How fast can you grab the concept of the application, eg how to use the application, what to do next, etc:

Very slow				**Very fast**
1	2	3	4	5

2. Is it easy for you to understand the concepts (as in Question 1) :

Very difficult				**Very easy**
1	2	3	4	5

3. Describe the overall learnability of the application, which is the easiness to use the whole application:

Very difficult				**Very easy**
1	2	3	4	5

Section 4: Evaluation on satisfaction

1. Rate the pleasantness of the application interface, such as the design, images used and position of the buttons?

Very unpleasant				**Very pleasant**
1	2	3	4	5

2. Rate the pleasantness of the application color to the eye :

Very unpleasant				**Very pleasant**
1	2	3	4	5

Section 5: Opinion on research's implementation

1. It is easy to grab the concept while using the apps?

Very difficult				**Very easy**
1	2	3	4	5

2. It is easy to remember the information provided?

Very difficult				**Very easy**
1	2	3	4	5

3. Rate the interface of the apps, either it is pleasant or not?

Very unpleasant				**Very pleasant**
1	2	3	4	5

4. Rate the research implementation, either it is suitable to be implemented or not?

Very unpleasant				**Very pleasant**
1	2	3	4	5

FEEDBACK AND FUTURE WORK SURVEY

Intro

This questionnaire is intended in providing the researcher valuable information regarding the feedback of this application. This questionnaire will be evaluating respondent opinion with regards to:

1. The relevancy of this application and also improvements in future work.

Background

Gender

___Male ___Female

Age

☐ 20-30 yrs ☐ 31-40 yrs ☐ 41-50yrs

1. Do you think this application helps to increase your awareness in taking Healthy Food?

☐ YES ☐ NO

2. Do you think the number of obesity sufferers can reduced after using this application?

☐ YES ☐ NO

3. For future works, which part that you think should be improved at? (You can answer more than 1)

☐ Interface design ☐ Meal suggestions ☐ Effects ☐ Challenges Quizzes

Others _____